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USSR Report

LIFE SCIENCES

BIOMEDICAL AND BEHAVIORAL SCIENCES

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IMMUNOLOGY

AEROSPACE MEDICINE

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DISTINCTIONS OF SPF RATS USED IN EXPERIMENTS ABOARD BIOSATELLITES

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 8, Aug 84 (manuscript received 5 Dec 83) pp 123-126

[Article by N. N. Liz'ko, V. I. Korol'kov, candidates of medical sciences, L. N. Petrova, V. M. Shilov, candidate of medical sciences, V. N. Frolov and L. V. Serova, candidate of medical sciences, Institute of Biomedical Problems, USSR Ministry of Health]

[Text] Before performing experiments aboard biosatellites, studies were made of intestinal microbiocenosis of 100 SPF rats in order to pursue dynamic observation of changes in intestinal microflora from the time the animals arrived in the vivarium to the start of the flight.

The studies, which were pursued on three batches of animals, were made after the rats had spent 1, 10, 30 and 50 days in a vivarium of the barrier type, with 5 animals per standard polyvinyl cage. Daylight lasted 12 h, ambient temperature was 22-25°C and relative humidity was 60-80%.

Studies of intestinal microecology of animals in the first batch revealed that, in the first group of this batch, the composition of intestinal microflora was characterized primarily by a high level of lactobacillus, the quantity of which exceeded by more than 1000 times the number of E. coli. This is typical for this strain of animals, just like the absence of clostridia and staphylococci. Yeast was found in negligible quantities. Asporous anaerobe and aerobe content, including streptococci, did not differ from values found in ordinary animals, whereas Proteus level was somewhat above normal values.

Interestingly, we subsequently found an increase in Gram-negative flora (the increase in E. coli and Proteus had a reliability of $P<0.01$).

Examination of the second group of animals in this batch, which was made 10 days after the rats arrived in the vivarium, revealed that the quantity of Proteus was identical to that in the first group on the first day in the vivarium ($P<0.05$). Just like the first group, this one failed to demonstrate clostridia in the first test, and there were staphylococci. Yeast was found in only two rats in the second group; E. coli content was higher than in the first group ($P<0.001$).

The results of examining the microecological distinctions of the intestine of rats in this group at a later time (after 30 days) were also indicative of an increase in Proteus and Streptococcus ($P<0.001$). Subsequently (after 50 days), no changes in Gram-negative flora (E. coli and Proteus) were observed ($P<0.05$). A high level and stability of lactobacilli was found, which is inherent in this line of animals.

Examination of the second batch of SPF animals revealed the following. The first group revealed, as did the second group of the first batch, a marked Proteus content ($P<0.001$) after 10 days in the vivarium. Like all previously tested animals, this group had no clostridia. Nor did we demonstrate any yeast; Staphylococcus was found in relatively small quantities.

We were impressed by the relatively low, for this strain of animals, level of lactoflora, which subsequently (after 30 days) dropped appreciably ($P<0.001$). As in the first batch of rats, we found here an increase in streptococci and Gram-negative bacteria ($P<0.001$). There was also an increase in staphylococci.

In the second group of animals, the substantial difference in intestinal microflora, as compared to the first group, is the more optimum proportion of lactobacilli and Proteus (10,000-fold), which was demonstrated after 10 days in the vivarium ($P<0.001$). There were no other basic differences in composition of intestinal microflora in these animals.

Analysis of intestinal microflora of rats in the third batch enabled us to evaluate their intestinal microbiocenosis as the most stable, as indicated by the low levels of aerobic bacteria, as compared to the preceding batch at this time, including E. coli and Proteus. This determined the marked prevalence of lactobacilli over aerobic flora ($P<0.001$), which is inherent in this line of rats. We also found no clostridia.

Thus, our findings from the study of distinctions of intestinal microflora of SPF rats are indicative of marked microbial contamination in the first 10 days in the vivarium. It was the most active with regard to Gram-negative bacteria. Thus, already after 1 day, the level of proteus flora of the examined SPF animals was considerably higher than in ordinary animals. An increase in Proteus content was noted in the next 10 days, and it remained high thereafter also (30th-50th days).

At the same time, the typical feature of intestinal microflora of the tested rats was absence of clostridia, absence or insignificant quantities of yeast and staphylococci.

Conventionalization proceeded best in the third batch of animals: the composition of their intestinal microflora differed favorably in low level of aerobic microorganisms from their levels in ordinary animals, while proteus contamination was less marked than in rats referable to the first and second batches.

Intestinal microbiocenosis in SPF animals during experiments aboard Cosmos-782, 936 and 1123. We examined the intestinal microflora of 121 animals in 3 series of experiments. Each series consisted of a flight experiment aboard a biosatellite, the results of which were compared to those

of two control experiments, synchronous and vivarium. The synchronous control experiment was conducted in a mock-up of the biosatellites descent vehicle; it reproduced all of the conditions of the flight experiment, with the exception of weightlessness. Vivarium control animals were kept in standard polyvinyl cages, with 5 rats in each, at all stages under conditions identical to those of the preflight period.

In the first series of experiments aboard Cosmos-782, we examined 21 animals (7 rats in each experimental group). At the start of the experiment, the age of animals in all three groups was 63 days. Duration of flight was 20 days.

Analysis of intestinal microbiocenosis after termination of the flight and synchronous experiments failed to demonstrate appreciable differences in composition of intestinal microflora. Thus, both groups of rats presented stable lactoflora, no clostridia or yeast, no reliable differences in quantities of anaerobic and aerobic microorganisms. Unlike the vivarium control groups, we found a decrease in quantity of aerobic microorganisms, including a decline of E. coli and Streptococcus ($P<0.01$).

In the second series of experiments, we studied 40 animals. The distinction of experiments aboard Cosmos-936 was the presence of 2 centrifuges, which were intended for further investigation of biological effects of artificial gravity. Five box-cages were placed on each centrifuge, with a single animal in each; the age of the flight experiment animals was 35-36 days and those in the synchronous experiment were 32-33 days old. Experiments lasted 18.5 days.

Microbiological examination of the intestine of animals used in this series of experiments revealed a highly stable lactoflora. We failed to demonstrate clostridia or yeast in any of the rat groups examined. As in the experiment aboard Cosmos-782, there was a reduction in E. coli in animals of the flight and synchronous groups. No changes in quantity of E. coli were demonstrated in vivarium control rats. We should mention the broader species composition of conditionally pathogenic enterobacteria in the flight group of animals.

We observed appearance of bacteria of the genus Klebsiella in all rats of this group, which were not demonstrable preflight. Appearance (in flight group) and increase (synchronous group) of Staphylococcus was a distinctive feature in the changes in composition of intestinal microflora in flight and synchronous groups of animals. We failed to demonstrate differences in intestinal microbiocenosis of rats submitted to artificial gravity.

Further investigation of changes in intestinal microflora of SPF animals was pursued in the third series of experiments aboard Cosmos-1129 biosatellite. We examined 60 rats 84-86 days old. As in the preceding case, flight duration was 18.5 days.

The findings again confirmed the stability of lactoflora inherent in SPF animals and absence of clostridia and yeast, in both the flight and synchronous experiments. As in the preceding experiments, we demonstrated increase in Staphylococcus in animals of the flight and synchronous groups.

Conclusions

As shown by these studies, the main distinction of intestinal microflora of SPF animals was stability of lactoflora, which was demonstrated in all rats (the only exception being 10 animals in the first group of the second batch). Evidently, prevalence and stability of lactoflora enabled the SPF animals to undergo conventionalization well, levelling off the possible pathogenic effect of Gram-negative flora at the time of active contamination and retain, after conventionalization, the clinical and physiological advantages over ordinary animals.

In view of these advantages, preference was given to SPF animals for experiments aboard Cosmos-792, 936 and 1129. The experiments aboard these biosatellites demonstrated lactoflora resistance to extreme conditions.

Perhaps, this was the cause of relative stability of microecological proportions of different groups of microorganisms in the intestine, as well as absence of microorganisms important to development of dysbacteriosis, such as clostridia and yeast. The observed decrease in quantity of Escherichia after the flight and synchronous experiments of the first and second series confirmed the presence of decline in microbial contamination in isolation.

The possibility of expansion of species composition of conditionally pathogenic enterobacteria was observed in the flight experiments aboard Cosmos-936 and 1129, and this is indicative of a more marked dysbiotic reaction of intestinal microflora in weightlessness. Artificial gravity did not prevent the dysbiotic response. Quantitatively, conditionally pathogenic enterobacteria of the genera Citrobacter, Enterobacter and Klebsiella did not exceed the norms inherent in ordinary animals, and this can be attributed to stability of lactoflora, which determines the low variability of quantitative indicators of conditionally pathogenic microflora.

The distinctions of the microflora of SPF rats and resistance of intestinal microbiocenosis no doubt also determined the clinical and physiological reactions of these animals, as compared to ordinary rats, in experiments aboard Cosmos-605. Thus, experimental SPF animals showed less marked lag in weight gain (as compared to the control), less marked stress reaction and no reliable differences in levels of bactericidal activity of the skin.

Thus, it was demonstrated that animals that have undergone conventionalization well and present a high level of lactobacilli, retain stability of intestinal microflora, as well as the distinctions of the SPF population even after experiments aboard biosatellites.

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POTENTIAL OF AGRICULTURAL SCIENCE TO SERVE AGROINDUSTRIAL COMPLEX OF NATION

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 8, Aug 84 pp 3-11

[Article by A. A. Nikonov, president and academician of the All-Union Academy of Agricultural Sciences imeni Lenin]

[Text] The Communist Party of the Soviet Union, headed by its Leninist Central Committee, is performing a giant task to implement the decisions of the 26th CPSU Congress, consistently raise the standard of living of Soviet people and provide for a firm peace on earth. The February and April (1984) plenums of the CPSU Central Committee confirmed the continuity of the party's domestic and foreign policies. Economic problems, the key problems for implementation of social programs in a fully developed socialist society, occupy a central place in the decisions of the Central Committee plenums.

Comrade K. U. Chernenko, general secretary of the CPSU Central Committee and chairman of the Presidium of the USSR Supreme Soviet, emphasized at a meeting with voters on 2 March 1984 that "... persistent and dynamic growth of the economy, and first of all its efficiency, are needed" for successful advancement.

The decisions of the February and April (1984) plenums of the CPSU Central Committee dealing with economic issues stressed the need to provide for stable, dynamic and purposeful development of the national economy, to switch it to successively intensive tracks, develop the initiative of worker groups, strengthen order, discipline and good organization.

The agroindustrial complex has an extremely important role in economic construction, since improvement of wellbeing of the Soviet people depends expressly on its development. It produces over 36% of the national income and forms three-quarters of the consumption fund.

At the All-Union Economic Conference, which dealt with problems of the agro-industrial complex and convened in March 1984, there was in-depth and comprehensive discussion of progress in implementing the Food Program, concrete tasks were put to party, soviet, economic agencies and scientific institutions in the speech of comrade K. U. Chernenko, general secretary of the CPSU Central Committee, and paper of comrade M. S. Gorbachev, secretary of the

CPSU Central Committee. Comrade K. U. Chernenko, in his speech at this conference, stated: "... The Soviet people can see for themselves that the Food Program developed by the party is being implemented stage by stage. But this is only the beginning. There are many major and large-scale jobs to be done in the future."

There have been good achievements in 1983, which is actually the first year of fulfilling the Food Program. There has been an increase in volume of agricultural production and labor productivity. Kolkhozes and sovkhozes delivered more grain, vegetables, potatoes, milk and meat to the government. There has been an increase in consumption of livestock and other valuable products. There has been strengthening of kolkhoz and sovkhoz economics. Profitability of production and profit have grown. All this is the result of implementation of the major economic steps adopted by the party, the result of the labor of Soviet people, among whome there is also a share of agricultural scientists.

Nevertheless, the demand for agricultural products is still greater than the supply. In order to fulfill the Food Program some persistent work is needed. There must be an increase in production of grain, feed, meat and other products of plant growing and livestock farming, and this must be done persistently, without interruptions or breakdowns. For this, it is necessary to make wise use of the enormous resource potential. The weather has not been good to us, and cardinal steps are needed to obtain stable and dynamic production, with ever increasing economy and efficiency in spending funds. We scientists of VASKhNIL [All-Union Academy of Agricultural Sciences imeni Lenin] are primarily responsible for scientific implementation of fulfillment of the entire Food Program.

There must be a clear idea about the most typical distinctions of the present stage of development of the agricultural sector of the economy. We refer to the systematic intensification of production, formation of the agroindustrial complex as an integral economic-production system and change to economic methods of management.

We have no alternative. Extensive methods are no longer capable of providing for the successful development of the economy.

Today, intensification is construed not only as accumulation of funds and resource potential, but primarily as increase in end product output per unit labor, land, water, energy and other resources, and the bioclimate potential. In this respect, intensification is linked with efficiency of production and increased labor productivity.

We shall be able to obtain a high impact from the means of production in use only if these means will themselves become improved. This was indicated by K. Marx, who stated that production expenses diminish when "... the best methods of labor, new inventions are used, machinery, chemicals, etc., are improved, in brief, when there are new ... means of production and methods of production" (K. Marx and F. Engels, "Works," Vol 25, Part 2, p 195). Thus, there must be cultivars and hybrids of cultivated crops that are more

productive and resistant to an adverse environment, animal breeds must be more productive and equipment more efficient. Technologies will become basically new, based on combined mechanization and automation, broad use of robots and computers, wise use of all objects and tools of labor. Only science, scientific and technological progress can and must provide this. For this reason, intensification must be viewed as a materialized science.

Since development of agriculture and the entire economy will proceed primarily via the intensive route, there is the inevitable conclusion that science too must develop intensively, and it must do so ahead of production. Intensification of science will proceed along the road of concentrating manpower and resources on the most pressing and major combined problems, moving ahead the target dates for completion of developments, rapid transmission of results to production and their high return. The intellectual potential must be used intensively and wisely, a scientist's time must be used wisely, as he is the principal figure in science. Sociological studies have shown that scientists spent 20 to 50% of their time on duties or work that is not inherent in them, which do not require high qualifications. There is particularly unwise use of the most qualified level of associates, the administrators of scientific departments. A scientist spends long years and large funds on his training, and his time must be used entirely in the area of his direct competence. Drastic changes will have to be done in this regard, in order to augment the return from scientific developments and their impact on production matters.

In addition to intensification, a distinction of paramount importance in the development of modern agrarian economy is formation of the agroindustrial complex as an integral production system with agriculture as its principal element. Within the limits of the agroindustrial complex, it is linked with tens of sectors that service kolkhozes and sovkhozes processing agricultural products and supplying them with means of production. While agriculture used the products of 28 sectors in 1959, 37 in 1966 and about 60 in 1972, in the early 1980's there were more than 90 sectors involved. The most varied sectors of the agroindustrial complex make use of agricultural products.

At the present time, the bulk of agricultural products undergoes industrial processing. More and more intermediate links are being formed between the initial agricultural raw material and end product; more and more factors are appearing, upon which relies the end result, and these factors are outside agriculture proper. About 90% of the cost of production capital of agricultural enterprises is of industrial origin. The flow from urban to rural areas and back is intensifying. Intersector ties are growing more complex. It is on this basis that the agroindustrial complex is formed as a complex integral production system.

There are several conclusions that ensue from this fact. In the first place, a consistent, systematic approach to the entire agrosphere as a single whole is also required in science. In the second place, the VASKhNIL, as the top scientific institution for agriculture, forestry and water resource management, can no longer limit itself solely to agricultural problems. The academy must broaden the area of its impact on all sectors of the agroindustrial complex, develop systems of farm management that cover both agricultural production itself and allied parts of the agroindustrial complex.

An important distinction of the present stage is that the increasing volumes of production, which make links and structure more complicated, require serious revision of the economic machinery of management and refinement of the control system within the limits of the agroindustrial complex.

The economic machinery that existed up to the May (1982) Plenum of the CPSU Central Committee was formed essentially against the background of predominantly extensive development of the agricultural sector. The party proceeds from the fact that the levers of management, planning and incentives are concrete forms of industrial relations, using economic laws in management practice. For this reason, improvement of the economic machinery consists of conforming industrial relations to productive forces. Concurrently with the Food Program, decrees were adopted on these issues and new management bodies were formed. The chosen route is correct, but there is still much work to be done. Analysis of the performance of 600 rayon agroindustrial associations revealed numerous problems that must be solved by agroeconomical science, first of all in the area of economic relations between sectors of the agroindustrial complex, equalization of their levels and legal norms.

The broad transition to economic methods of management, systematic cost accounting and collective contracts began recently, and in essence we have yet to form an effective mechanism that would combine planning with concerned initiative and independence of worker groups. Profound knowledge of economic laws and methods, ability to discern categories such as price, profit, cost, profitability, output-capital ratio and cost accounting are expected of all our cadres and, first of all, scientific ones. Each specialist and scientific worker must be able, within his area of endeavor, to make a dynamic analysis of processes such as correlation between growth in labor productivity and wage fund, increase in investments and return on them, correlation between expenditures and product output. It is necessary to be knowledgeable and competent in use of methods that maintain the proper proportions between these indicators. In this area, by far not all is well. And there must be consistent increase in relevance of economic work and economic indicators in all areas of endeavor.

Agrarian science in the area of economics must develop the means of intensifying production on the basis of resource-conserving technologies; it must propose methods for innovative use of industrial and scientific-technological potential, increase in effectiveness of capital investments; it must achieve rapid growth of labor productivity, lower cost of production and adopt cost accounting on all levels; it must improve the placement of plants, to make utmost use of the bioclimate potential. The immediate tasks include validation of forms of collective organization and payment of wages on the basis of contracts, improvement of planning, management and the economic machinery as a whole, with fuller use of economic levers.

Social development of rural areas is becoming increasingly pressing, since the role of the human factor is increasing in a time of scientific and technological revolution. This problem must also be solved because of the complicated demographic processes that are taking place in different parts of our country.

All this makes it incumbent upon institutes concerned with economics to revise their work substantially. The All-Russian Scientific Research Institute of Economics, Labor and Management in Agriculture, Lithuanian, Central Asian and Siberian scientific research institutes of economics, headed by academy members Yu. T. Buzilov (deceased), B. I. Poshkus, S. N. Usmanov and V. R. Boyev, have activated their endeavors in the light of the last requirements. The Belorussian Scientific Research Institute of Agricultural Economics and Management is responding promptly to the practical demands and offering relevant suggestions. At the same time, the head and regional institutions must act faster and in greater depth to furnish practical workers with scientific recommendations.

In the immediate future, it will be necessary to conduct large-scale economic experiments, give scientific and methodological assistance to new management bodies to help them master management methods based on economic leverage. This is not an easy transition. It involves overcoming psychological barriers and the habit of being governed by administrative methods, as well as the need to be briefed on economics.

The change to the intensive route of development, change in nature of agricultural production within the limits of the agroindustrial complex and assimilation of economic management methods impose high demands on science. Its role grows drastically under such conditions. In practice, this means that all steps pertaining to agriculture, starting with decision making in the area of socioeconomic problems, technical and technological policies and ending with refinement of forms and methods of management on all levels, must all--from top to bottom--be based on strictly scientific and economic precise developments and recommendations. Science must prevent willful decision making. It is absolutely intolerable in the present situation.

The entire management practice must now be based on scientific advances. This is why organization and methodology of science must be the most advanced and closely linked with practical demands. At the same time, the authority of science and scientific institutions must be augmented, and the prestige of scientists raised. All this is achieved primarily when science furnishes major developments that actively transform industry. The scientist must both generate ideas and participate in implementing them. Work must be intensified in two directions in order to increase the role, impact and effectiveness of science. The first is to develop the most pressing, burning problems, the solution to which is needed by practice. The second is to have immediate applications to industry, to provide kolkhozes and sovkhozes, agricultural, planning and designing organizations with concrete recommendations on all matters, including technical, technological, biological and socioeconomic ones, as well as with the results of such work--highly reproductive seeds, pedigreed livestock, technologies, etc. This is an exceptionally responsible function, since it solves the fate of industry and implements the results of research.

The presidium of VASKhNIL examined the list of the most pressing and largest problems, on which scientific institutions will concentrate. What are these problems? In addition to socioeconomic ones, they pertain to assuring stability of agriculture. This is a multifaceted problem because there are many

destabilizing factors. We refer to climate, particularly drought, diseases and pests of plants and animals. Economic factors (prices, equivalence of exchange, wages) can also be instrumental or not in stability of agricultural production.

The problem of stability has long since been on the mind of scientists in our country, since we are living and farming under rather difficult environmental conditions. Starting with the classics of our country's agriculture--V. V. Dokuchayev, A. P. Kostychev, A. A. Izmail'skiy--a colossal amount of analytical material has been accumulated to date, and many constructive proposals have been made. Yet the problem is still there. From year to year there are some regions that suffer from drought and other extreme environmental phenomena. And this is the heaviest burden on the economy of the entire country.

The problem is complex, and it is impossible to solve it by addressing oneself to any single factor; one must consider and use the entire spectrum of conditions that provide favorable water, temperature and air conditions for the soil, enrichment of the latter with nutrients, protection against erosion, accumulation of organic substances, proper selection of crops and technology.

Land improvement, primarily irrigation, is an effective means of improving stability. Virtually all of our land requires some form of improvement. At the present time, a long-term program is being developed on this score, to cover the period to the end of this century. But, in addition to the water of large rivers, fuller use should be made for irrigation of local run-off and small rivers; more work should be done on construction of ponds and reservoirs, as well as flooded river irrigation. In brief, things should be set up in such a way as to utilize for foodstuffs every cubic meter of water. And great economy is also needed in using water, since it is becoming an increasingly scarce resource. The main thing, however, is to make intensive use of each hectare of improved land.

Many-year experiments and extensive experience have shown that steps combined in the concept of "dry," soil- and water-conserving agriculture is a reliable means of lowering the adverse effect of drought. We refer to crop rotation with pure fallow and minimal treatment of soil, which is also confirmed by the experience gained this year in the Volga region, North Caucasus, Urals and the Central Chernozem Region.

Our agricultural science has much to its credit. The work of T. S. Mal'tsev and A. I. Barayev, the staff of the Siberian Scientific Research Institute of Agriculture and several other institutes developed farming systems that protect soil against devastation, improve its fertility and withstand drought. The people are grateful to them for this. The fact that farming systems in our country must conserve soil and water, and that the general trend of their development is aimed at minimizing treatment is indisputable. However, it is just as indisputable that one cannot proceed by rote in this matter, one cannot extrapolate some procedure to all of the diverse conditions in our country. One must take into consideration distinctions referable to climate, soil, topography, crop being raised and even each field. We need spirited creativity, in-depth knowledge of objective laws and conditions, consideration of the entire aggregate of factors. And in this respect the area of endeavors of science is inexhaustible.

We now know how to control wind and water erosion. Nevertheless, these destructive forces have not been arrested, yet they must be arrested everywhere. We do not need to argue about some procedures or other, but must perform precise, multivariant experiments and decisively introduce to practice the developments that have justified themselves.

One cannot minimize the significance of land and forest improvement. It is effective if it is set up properly and in a system together with other elements of soil-conserving agriculture. This is indicated by the century-old practice in the Kamennaya Steppe and the most recent 1984 data for areas of the Central Chernozem Region, Volga region, North Caucasus and the Ukraine. In addition, there are enormous sand areas, even in the European part of our country, for example, Kalmyk ASSR, Volga, North Caucasus, that are in urgent need of forestation, otherwise deserts may be formed. Development of ravines and gullies must be arrested by land and forest improvement measures, and mountain slopes must be reinforced.

Climate is an objective factor, and as yet we cannot control it. But proper selection and placement of crops and cultivars, as well as agricultural technology, with consideration of distinctions of climate, soil and field, is a source of a large reserve for stability and productivity. Breeding work should also be aimed at this. Cultivars bred in Odessa, Don region, Krasnodar, Mironovo and Bashkiria are well-known far beyond our frontiers.

Breeders are performing a huge job, and they have made definite strides according to many indicators on a modern worldwide level. The development of 52 breeding centers for plant growing and furnishing them with equipment have helped the scientist to drastically increase labor productivity and accelerate the breeding process. In recent years, short-stem and semidwarf rye and wheat cultivars have been developed, with high productivity of winter durum wheat, nonshedding peas, early maturing corn hybrids and many others. All this is going to production.

At the same time, many cultivars are susceptible to diseases, particularly rust, powdery mildew and root rot; they are not impervious to drought and are not of high quality under farming conditions. For this reason, the attention of breeders should now be turned sharply toward improving plant immunity, quality and resistance to drought and other negative environmental factors. Varietal testing should also be governed by this. By concentrating efforts, kolkhozes and sovkhozes must be provided with immune and resistant varieties within the next 3-4 years. The means of achieving this are in the hands of the breeders.

A need also arises to have a scientifically validated, for example, general, plan for stability of farms on the oblast, rayon and individual farm level, which would reflect the entire diversity of specifics and include the whole set of biological, technical, technological, economic and social steps to solve the problem. It would become the most important element of scientific support of the Food Program.

With the help of regional departments and scientific institutions, the VASKhNIL will conduct an analysis in the immediate future of the situation concerning

the state of affairs with stability of agriculture, and it will undertake development of such a plan. This will amend the farming system and lay the foundation for development of systems of farm management as a whole. All this will require close cooperation with planning organizations and farming agencies.

The many years of experience of entire regions, and even this year, convince us that overcoming drought and other problems has been more successful in areas where a system of farming and system of management based on scientific data have been adopted.

The dynamic nature of development of the economy is provided by both the constant build-up of production potential and increased efficiency in using it. The share of capital investments into the USSR agroindustrial area is quite large, and in agriculture alone it constitutes 27%. However, with the use of this potential, particularly equipment, mineral fertilizers, improved land, installations, productive livestock and many other factors, there are still problems. It has happened not infrequently that supply of fertilizers was increased, but harvests diminished. The stock of animals increased, yet yield of their products dropped. Technical equipment increased, yet labor productivity remained unchanged.

This often happens due to failure to adhere to the correct proportions, flaws in structure of funds and many other causes. It is the duty of science to find the real causes and provide good developments aimed at a high return on expenditures. We must also increase use of chemicals in agriculture, change to integrated mechanization, continue to build up production funds and optimize their structure. But mainly, full use must be made of them.

More attention should be given to biological factors for intensification of farming. Maximum use must be made of waste from plant growing; we should change to waste-free technologies for agricultural production, develop biological methods of controlling plant diseases and pests within the limits of integrated systems, activate the search dealing with fixing atmospheric nitrogen by nonleguminous plants. Promising work is being done in this direction, but rather timidly as yet, at the All-Union Scientific Research Institute of Agricultural Microbiology. Worldwide science is pursuing extensive studies of the possibility of fixing of atmospheric nitrogen by grain plants. We too should activate this direction in every way. Estimates have shown that if rhizotorfin output were increased to a level that would take care of 10 million hectares of crops there would be a substantial reduction in need for nitrogen fertilizers and more than 2 million additional tons of plant protein could be recovered. This is more than one-third of the present protein shortage.

There must be more active development of biological agents for control of pests. In 1983, such agents were used on more than 21 million ha, and pesticide treatment was eliminated entirely on 10 million ha because of this. Entomophages and microorganisms have worked well in the place of chemicals. The All-Union Scientific Research Institute of Biological Methods of Plant Protection should be more aggressive in its work.

The academy's Presidium is assuming control of questions of intensification of livestock breeding. It is planned to hold a special session in the very

near future to discuss these issues, prepare a program that would enable kolkhozes and sovkhozes make fuller use of the productive capacities of the enormous stock of animals that they now have.

Breeders have developed many valuable breeds of dairy and beef cattle, swine, sheep and fowl. Crosses have been developed of broilers that are as good as the best specimens in the world with regard to return on feed. Nevertheless, livestock breeding, with the exception of poultry farming, has been developing primarily by the extensive route until recently, with enormous outlay of feed per unit product and very low animal productivity. There is a clear trend in worldwide science and practice to use holsteins in breeding cattle. The desirability of this trend has also been convincingly confirmed by the experience gained in our country. A pertinent program has been elaborated, and scientific departments dealing with livestock breeding should be more active in implementing it.

The veterinary detachment of agricultural science is also quite important to progress in livestock breeding. Veterinary scientific institutions are working well, and we are proud of them. Numerous patents and effective agents, which have gained worldwide recognition, are indications of the high level of Soviet veterinary science.

Brucellosis and tuberculosis have not been definitively eradicated; from time to time there are outbreaks of other dangerous diseases, and this causes enormous losses. So that the veterinary detachment must solve many difficult problems.

Energy problems require more and more attention. In the expression of F. Engels, farming is the only sector of the national economy that accumulates energy by means of labor. At the same time, it is the largest consumer of energy. Not only overall expenditures, but energy outlay per product unit are increasing. For example, while 57 kcal were expended per 100 kcal biomass in 1950 and 70 kcal in 1960, the figure for 1980 was already 86 kcal. Serious proposals are needed for efficient use of energy. Evidently, they should be made in the following principal directions. The first is to raise crops with a high return on expended energy. We refer primarily to alfalfa, clover, lupine, leguminous, oil-containing and grain crops. The second is to minimize soil cultivation and other technological processes in agriculture; combining operations with one run of machinery over a field. The third is to use nontraditional sources of energy: sun, wind, water and biomass. It is imperative to expand such investigations, in particular, at the All-Union Institute for Electrification of Agriculture. The fourth direction is to provide incentives for economical use of fuel, energy, equipment, fertilizers, agents for plant protection and other resources.

Apparently, broader use of the energy approach should also be made in the area of methodology, comparing energy expenditure to its yield in the form of products. Ultimately, it will be necessary to revise many technological practices that have not justified themselves in efficiency of energy use.

In addition to problems of energy, engineering science is faced most acutely with tasks of developing systems of machinery for waste-free and

resource-conserving technologies in plant growing and livestock breeding, and the machinery must be of a high quality, on a par with worldwide standards. We must catch up in this area.

Development and implementation of regional plans for economic development will be under the close scrutiny of the Presidium of VASKhNIL. We refer, first of all, to the Nonchernozem Region of RSFSR which occupies a territory of 2.8 million km^2 and has a population of 61.8 million. There, a revision is needed of the structure of agriculture; a substantial turn must be made in the direction of feed production, sowing clover, development of dairy cattle farming, intensive swine breeding, Romanov method of sheep raising, potato and flax growing. These directions of development are indicated both by environmental conditions and high degree of urbanization of this region, as well as the sociodemographic situation in rural areas.

The mountainous parts of our country, which have 79 million ha of farm land, are a serious subject for scientific developments. With proper organization of agriculture there, one can recover a large amount of milk, cheese, meat, wool, young pedigreed stock and potatoes. Development of these regions is of great economic, social and political importance. A plan for such a program has been prepared by a commission headed by V. I. Metreveli, academician of VASKhNIL.

Siberia, the Far East and the North merit the constant attention of science; industry is developing more and more actively there, and there is a need for these regions to have their own reliable food base. The Siberian Department of VASKhNIL has acquired some good experience in this matter. But the work must be expanded.

The demographic situation is exceptionally favorable and bioclimate potential is high in southern parts of our country--Central Asia, Trans-Caucasus and Moldavia. This is attributable to the rapid development of intensive farming there. Scientific organizations are faced with the tasks of developing the methodological bases for fullest use of resources existing there.

The steppe regions of Russia, the Ukraine and Kazakhstan are the principal granary of our country. The main problem there is to provide for stable grain farming and all agriculture, preservation and increase in fertility of chernozem [black], chestnut and other types of soil, overcome water and wind erosion and develop stable production of high-grade grain.

The methodological sophistication of research at all of our institutes must be improved to solve all of these major problems. First of all, fuller use should be made of the advances in the basic sciences, through closer collaboration with institutes under the USSR Academy of Sciences and deployment of research at institutes in our system [VASKhNIL]. Thus far, agriculture has developed primarily by the extensive method, and production had to settle for developments with narrow applications. Now, with the change to intensive farming, this is no longer sufficient. Research and development by agricultural science must be integrated and profound; the industry must be able to take large steps forward. Traditional methods do not always lead to the desired results. Although we view agricultural science as an

applied discipline, not a single team of workers can function without research and theoretical work, and basic investigations must be expanded.

Good philosophical training and knowledge of the laws of dialectics are needed. This requirement was put to Soviet scientists always, but at the present time it is particularly necessary to adhere to it, since we are on the verge of major breakthroughs in the nature of production.

Systems analysis and computers must be used extensively in economic, as well as biological and technological investigations. Our times dictate this. But, unfortunately, introduction of modern scientific methods and instruments is proceeding extremely slowly. We shall continue to furnish scientific institutions with equipment and learn to use it. Evidently, the TSKhA [Timiryazev Agricultural Academy] will have to take on, together with the All-Union Scientific Research Planning and Technological Institute of Cybernetics, the training and retraining of cadres in this specialty for all scientific institutions of VASKhNIL.

In plant breeding, it is necessary to make wide use of gene, chromosome and cell engineering, chemical and physical mutagenesis, classical methods of hybridization. New techniques will make it possible to design organisms with programmed traits, for example, to insert genes of drought resistance in plants, which is of exceptional importance. One should proceed more broadly and boldly to master gene engineering in order to achieve planned control of development of new organisms.

Zygote transplantation holds great expectations for livestock farming. This method makes it possible to produce up to 5 calves per year from a highly productive cow and, accoridng to some data, up to 15-20 calves. With purposeful and well-organized work, we would be able to develop in the foreseeable future some very valuable bulls for a network of artificial insemination of the most productive record-holding cows. This enormous reserve for growth in animal productivity is both very time-consuming, meticulous and fine, it is a very responsible job. It is now under the strict control of the USSR Ministry of Agriculture and Presidium of VASKhNIL.

Broader use of general guidelines for machine science and materials science should be made in engineering. Methodology will be changed in a way to appreciably increase labor productivity of scientists, reduce time required to complete developments using basic sciences, modern computers, proper organization of labor in a group.

The report of comrade M. S. Gorbachev at an All-Union economic conference on problems of the agroindustrial complex advanced the task of forming a closer link between the interests of science and industry. In practice, this means integration of science and industry, intensification of the impact of science on industry, their interweaving. We, agricultural scientists, must be concerned, first of all, about having our research reach a state of high enough refinement and quality to be used on the fields and in the farms, as well as planning organizations. This is probably the first and foremost requirement of scientific teams. More active use should also be made of traditional forms of propaganda--the press, exhibits, seminars, radio and television.

At the present time, there are 38 scientific production associations at work in agriculture. There are 20 more at the formative stage, and it is planned to form at least 30 before the end of the current five-year plan. These progressive forms of integrating science with production, as already proven by experience, make it possible to rapidly advance scientific developments to practical use, on the one hand, and improve incentives for scientists for such developments, on the other. We have undertaken the task of gradually reorganizing regional institutes and experimental stations using the principles of scientific production associations.

Experimental farms of institutes occupy an important place in connecting science to production. The VASKhNIL already has 408 of them, and they cover an area of 2.6 million ha. These are actually the proving grounds of science. At the same time, they should become standards for farm management in their regions. However, many of them, infortunately, still do not meet the high requirements. Institutes are entirely responsible for these farms.

Zonal systems of agricultural management, which include systems for farming, animal breeding and feed production, have justified themselves as forms for introduction. In the past, they were somewhat vague, in the form of recommendations and descriptions. At present, it is imperative to develop models of farm management with precise quantitative parameters, developing the models over the entire vertical line, through the management level. Evidently, one science alone cannot cope with this matter. We need the active participation of agricultural agencies and planning organizations, management of methodological developments which will be assumed by the VASKhNIL. But the new methodology will have to be mastered. In the immediate future, we shall busy ourselves seriously with training personnel to work on this problem. Things are better with systems of agriculture and livestock breeding; they are more concrete and have been investigated more. It is more of a problem with management systems as a whole, where it is necessary to properly integrate all elements: resources, technology, economic and social aspects. Developments dealing with management systems will acquire priority status, and institutes of all levels must be involved in them.

Recently, criticisms have been addressed to the VASKhNIL, including some from the press. We are reacting in a business-like way to each comment, so that we could bring the most benefit through our performance in the complicated and pressing sector of scientific support of the Food Program and development of the agroindustrial complex. Each of us will be guided by the ideas voiced by comrade K. U. Chernenko: "Party and government cadres are gaining the good feelings and respect of the masses primarily with regard to a living social cause, they are gaining these feelings through their vigor and knowledge, personal example and behavior...." High authority is enjoyed by the scientific team or scientist whose proposals make a serious contribution to economic development of our country, of its regions. We have such teams and scientists, many of them, and we are proud of them.

In addition to a clearcut program and proper organization, qualified personnel, competent administrators, a modern material and technical base and a healthy psychological climate are needed for the successful performance of any scientific group.

We are rich in both institutes and scientific cadres. However, the situation is worse with regard to age structure and professional qualifications. There is a decline in share of doctors of sciences, particularly in agricultural and engineering disciplines. In the last 10 years, there has been a 3-fold increase in number of doctors over 60 years of age. There is extremely uneven regional distribution of doctors. While there are an average of 11 doctors per institute under Union subordination, there is 1 per institute in the Siberian Department of VASKhNIL, and 2 per institute in the eastern and All-Russian departments.

Recently, much work has been done in the area of material and technical supply of scientific institutions and increase in available capital earmarked for labor. In 10 years, cost of equipment scaled per scientific worker has increased by 2.4 times and reached 13,700 rubles. In the future, we shall continue to improve supply of laboratory instruments, electronic computers and small machines for scientists. But the main things now are professional qualifications, general methodological and theoretical training of cadres. The Presidium of VASKhNIL has outlined steps to intensify training of personnel with the highest qualifications, i.e., doctors of sciences.

Nor is all well in the area of training candidates of sciences through graduate studies. It is being offered at 84 academy institutes. For the time being, only every third graduate student finishes his training at the specified time. There are institutes where not a single graduate student has submitted his dissertation for defense for several successive years. This applies to the Ukrainian Scientific Research Institute of Irrigated Farming and Altay Scientific Research Institute of Farming and Cultivar Breeding. Evidently, it is necessary to improve the network of graduate schools, strengthen the administrator staff and, mainly, thoroughly screen talented young people for scientific work. Without talented people there will be no real science. We must take care of our "golden fund," the venerable scientists, and surround them with young people. The complement of scientific teams should be reinforced with young cadres with equal vigor, and this should be done boldly and in all areas, adhering to the guideline, which has proven itself, of combining experienced and young scientists.

The existing forms of advanced training are not effective enough. In 1983, only 300 scientific associates underwent retraining at the TSKhA, Moscow State University and other higher educational institutions and scientific research institutes. Fuller use should be made of the Timiryazev Agricultural Academy and Higher School for Management of Agriculture, the leading VUZ's of the nation, major scientific research institutes, where there are scientists who are proficient in modern investigative methods. Here is an example. At the All-Union Scientific Research Institute of Livestock Breeding, N. I. Sergeyev has been working for about 10 years on zygote transplantation; he has mastered this well and his laboratory has succeeded in having up to 60% of the zygotes accepted by receipients. The figure is several times lower at other institutes where analogous centers have been established. Why not open an All-Union school for transplant training at the All-Union Institute of Livestock Breeding? The presidium of VASKhNIL has advanced such a decision. The same should be done in other branches of science.

In 1983, we held seminars with administrators of scientific institutions, including institute directors. This turned out to be beneficial, and we are developing such activities. Seminars will be organized for deputy directors in the science field, then with scientific secretaries and other categories of workers. The objective is to teach people to effectively manage a team of scientists on any level, with consideration of current problems.

The role and efficacy of contests and certification of scientific personnel must be increased. It is time to revise the state concerning certification and contests for scientific workers; it should be made more effective, informal. Much depends on the inherent stand of scientific councils, their composition and responsibility.

Philosophical and methodological seminars right at the institutes may become an irreplaceable form of theoretical growth of scientists.

The presidium of VASKhNIL is upgrading the style and methods of its work. Speaking self-critically, we are doing this timidly thus far. What should be the main element in the work style of the presidium, departments, institutes and each scientist? First of all, there must be profound awareness of duty to country and the people, personal responsibility, good citizenship and principle-mindedness in solving all problems; exactingness toward oneself and coworkers; frankness and benevolence in interpersonal relations, assessment of people on the basis of their deeds and concrete results of work; ability to discern innovations and support them promptly; always to view the essential element and not become submerged in trivia; to defend systematically objectively proven positions and not give in to serving time; to always stand, in the graphic expression of N. I. Vavilov, "on the globe," i.e., on a par with worldwide scientific achievements.

The academy has started the practice of visiting meetings of the Presidium of VASKhNIL to institutes that have accumulated positive experience with certain problems. Recently, there was a joint meeting of the presidiums of VASKhNIL and of the All-Russian Department of VASKhNIL at the VNIETUSKh [expansion unknown] on collective contracts, and a meeting of the Presidium of VASKhNIL at the All-Union Institute of Livestock Breeding dealing with zygote transplantation. A series of such visiting meetings has been scheduled. This familiarizes us more with institutes, involves a broader circle of scientists in discussion of issues and strengthens the ties between science and industry.

The Presidium of VASKhNIL attributes much significance to broad and close collaboration with institutions of the USSR Academy of Sciences. There have already been some good experiences; issues have been discussed, about which we should like to work together on a cooperative basis. They include models of economic systems with extensive use of mathematics; biotechnology and development of new genetic and physiological-biochemical breeding methods to develop base material for organisms resistant to drought and stress factors; refinement of an integrated system for plant protection; solving the problem of biological nitrogen; development of new forms and types of mineral fertilizers and pesticides; improvement of reliability and wear-resistance of farm machinery by coating it with protective powder; development of new methods and equipment for use of energy from renewable sources; advanced

training of scientists in promising directions of science. We are pleased with the fact that we are encountering understanding and support on the part of the USSR Academy of Sciences.

We consider it mandatory to strengthen routine ties between the Presidium of VASKhNIL and regional departments with scientific groups, agricultural agencies and other elements of the agroindustrial complex, as well as production enterprises. These ties are the source of strength, mutual understanding of science and industry, and the assurance of success.

The Presidium of VASKhNIL will have to revise management, organization and planning of scientific research. This is the area of endeavor where one achieves better effectiveness of science at virtually no additional expense.

The plans for coordination of research are overloaded with numerous secondary assignments, while coordination is ineffective and, not infrequently, formal. The Presidium of VASKhNIL has examined these matters carefully. In the future, only the most important tasks of national and general sectorial relevance will be left in scientific and technological programs. Local tasks are included in regional programs. A minimum number of sectorial and zonal institutes will be called upon to participate in general sectorial tasks. The capabilities of all other institutions should be united to solve regional problems. Coordination of their work should also be contained within the limits of regions, republics and oblasts. Such an approach develops the initiative of scientific groups, rids them of guardianship and formalism.

But the role and responsibility of leading and zonal scientific research institutes must grow as research centers, responsible for development of promising investigations and scientific implementation of the Food Program, as well as introduction of scientific advances to industry. Unfortunately, many institutes are still not performing these tasks in full, as we have been told by the CPSU Central Committee.

Today, a new form of organization of labor in science is paving a road for itself more and more; we refer to formation of temporary teams that perform urgent, important and unique assignments. This is a self-styled brigade contract in science, and it should be developed and supported. Formation of such groups on a voluntary basis makes it possible to make fuller use of creativity of scientists. The Presidium of VASKhNIL will support this practice in every way. It is particularly important to attract young, talented scientists to such teams.

Traditions have always been a significant factor that influences the performance of a team and leaves its imprint on work style and methods. One should support and develop good traditions. And history has been generous to us in this respect.

First of all, one should not forget the fact that the VASKhNIL was founded by direct order of V. I. Lenin and has borne his name from the day of its inception. The organizational execution of this academy coincided with a breakthrough in agriculture in our country, its collectivization. The first

members of VASKhNIL were outstanding scientists of our country, who brought worldwide glory to Soviet science; they developed advanced scientific schools and directions. We refer to Nikolay Ivanovich Vavilov, Nikolay Maksimovich Tulaykov, Vasiliy Prokhorovich Goryachkin, Mikhail Fedorovich Ivanov, Konstantin Ivanovich Skryabin, Aleksey Nikolayevich Kostyakov, Dmitriy Nikolayevich Pryanishnikov, Vasiliy Robertovich Vil'yams, Georgiy Karlovich Meyster, Petr Mikhaylovich Zhukovskiy, Vasiliy Sergeyevich Nemchinov and others.

At the present time, many institutes have been named in honor of Timiryazev, Dokuchayev, Michurin, Luk'yanenko, Pustovoyt, Remeslo and other prominent figures in agricultural science of our country.

It was stressed at the February (1984) Plenum of the CPSU Central Committee that "Continuity is not an abstract concept, but a real, living matter. Its essence is primarily not to stop, but to advance."

What then is the most typical feature in the endeavors of our prominent scientists, and what must we take from their legacy to advance better? Our leading figures were notable for such traits as constant search and rapid response to the most burning needs of life and practice, principle-mindedness and scientific conscientiousness. They have always been at the leading edge of worldwide science. We believe that all of us should perceive these traits as the legacy and tradition of the founders of our academy.

Many concrete problems were solved differently at different stages of historic development of agriculture. But the basic qualities of loyalty to science and country have and will always distinguish a genuine scientist. And today, we should be guided by them, like a compass, and cast aside everything that is superficial, accidental, that does not contribute to solidarity and principle-mindedness in matters of science and practice.

A proper work style combines democracy, initiative, clarity, discipline, deep knowledge of the matter at hand and situation in scientific groups, a close connection with industry. We shall firmly dismiss and reject any manifestations of poor organization, slowness and superficial approach to the job.

The VASKhNIL has a large scientific potential and qualified manpower, capable of solving large-scale problems. We have many good, modern developments. But at present another, much higher level is needed. We shall make an in-depth analysis of our achievements and oversights, pick out the most worthy elements, concentrate on major, pressing and integrated problems, and this will be the best response to the decisions of plenums of the CPSU Central Committee and speeches of comrade K. U. Chernenko, general secretary of the CPSU Central Committee.

Guided by the indications of the CPSU Central Committee and following the traditions of the academy, agricultural scientists will make every effort and offer a serious contribution to the solution of historical problems of improving the development of socialism.

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PRESIDIUM OF ALL-UNION ACADEMY OF AGRICULTURAL SCIENCES IMENI LENIN

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 8, Aug 84
(signed to press 20 Jun 84) pp 149-153

[Text] At a scheduled meeting, the Presidium of VASKhNIL [All-Union Academy of Agricultural Sciences imeni Lenin] examined the question of improving the industrial processing of poultry farming products. YE. G. SHUMKOV, candidate of biological sciences, general director of the All-Union Scientific Research Institute of the Poultry Processing and Glue-Gelatin Industry, "Complex" Scientific Production Association of the USSR Ministry of the Meat and Dairy Industry, delivered a paper.

One of the tasks put by the 26th CPSU Congress to the nation's agroindustrial complex to implement the Food Program is the need for proportionate and balanced, proper and high-grade agricultural products, their processing and delivery to consumers. This was stressed again at the All-Union Economic Conference on Problems of the Agroindustrial Complex.

Poultry farming is one of the most dynamically developing sectors of agriculture. Gross output of eggs and poultry meat is growing annually. The processing sectors must be prepared for high-grade processing of the ever increasing volumes of raw materials. With the change of poultry farming to an industrial footing, there has been a drastic increase in capacities of slaughtering shops, new types of more advanced equipment are used and technological processes have been refined. However, in recent times, some disproportion has been found between growth in volume of egg and poultry production, on the one hand, and their prompt, combined processing.

In view of the rapid growth of poultry meat production, more powerful equipment is needed to process it, with an output of 6000-9000 fowl/hour, which would make it possible to process different types of fowl, differing in size and age, on the same line. Thus far, operations such as delivery of fowl for slaughter, complete evisceration, packing carcasses and several others still require considerable manual labor. Fowl carcasses are still being put out mainly in partially drawn form. Use of waste from complete evisceration, which constitutes 8% of live weight of processed fowl, would yield thousands of tons of protein feed and bone meal. In addition, it should be borne in mind that putting out partially drawn fowl does not guarantee the epidemiological and epizootiological quality of the product. A change to complete evisceration is economically expedient and, from the sanitary point of view, necessary.

Horizontal vacuum boilers are needed to process waste from butchering in preparation of meat-bone meal. By processing industrial raw material in such boilers, it is possible to recover feed meal with a crude protein content in excess of 30%, which is free of pathogenic microflora. It is necessary to set up carcass packaging in polymer film, which protects them from quantitative loss of meat and preserves quality during storage.

The knowhow gained at poultry farms has shown that there is a percentage of carcasses that do not meet standard requirements, and it is inevitable for some reason or other. It would be desirable to use them for by-product processing, producing prepared foods in the form of boiled carcasses, smoked fowl, pates and canned goods.

With increase in egg production, there is also increase in their industrial processing (frozen and dry egg products). In view of the fragility of the shell and flaws in technological processes of gathering, sorting, packing and transporting, about 10% of the recovered eggs are nonstandard (soil, damage to shell, low weight). Such eggs are processed into powder. If all eggs with damaged shell were used for this purpose, at enterprises of the RSFSR Poultry Industry Administration alone one could produce up to 12,000 tons/year of powdered eggs. Specialized vehicles for transportation of fowl, containers for eggs and poultry meat are needed.

In order to move on to a new stage of industrial processing of poultry, modern, well-equipped butchering shops and modern technology are necessary. There must be speedy solutions to all problems of integrated poultry product processing.

In recent years, the Myasomolmash [meat and dairy mashinery] Experimental Design Office in Minsk and Poltava Meat Equipment Plant of the Ministry of Machine Building for Light and Food Industry and Household Appliances, the Kompleks Scientific Production Association developed several prototypes of new equipment. However, machine builders have accepted for series production only part of the new types of equipment. Even the limited volume of introduction of new equipment yielded more than 10 million rubles of actual profit in 3.5 years of the 11th Five-Year Plan, which is indicative of the effectiveness of new equipment and an urgent need to expedite its mass production.

The Presidium of VASKhNIL deems it desirable for the Kompleks Scientific Production Association and All-Union Scientific Research Technological Institute of Poultry Farming to develop for the 12th Five-Year Plan a unified special-purpose, integrated national scientific technological program for production and processing of eggs and poultry.

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The joint session of the Presidium of VASKhNIL and Presidium of the All-Russian Department of VASKhNIL was a visiting one, and it convened at the All-Russian Scientific Research Institute of Economics, Labor and Management in Agriculture (in Kosino, Moscow Oblast).

In his opening remarks, A. A. NIKONOV, academician of VASKhNIL, observed that the session was devoted to a timely topic--scientific support of introduction

of collective contracts to agricultural enterprises. Papers on this subject were delivered by YU. T. BUZILOV (deceased), corresponding member of VASKhNIL and director of VNIETUSKh [All-Union Scientific Research Institute of Economics, Technology and Management of Agriculture?], and V. F. MASHENKOV, doctor of economic sciences, acting director of VNIESKh [All-Union Scientific Research Institute of Agricultural Economics]. They dwelled on such problems as intramural cost accounting and collective contracts, optimum composition, forms and dimensions, specialization of groups on contracts, their models for different zones of the country, managerial functions of administrators and specialists, having their wages consistent with the end achievements of contracted brigades and units, etc.

The following participated in discussion of the papers: R. M. BOGDAN-BLAKITNYY (USSR Ministry of Agriculture), B. M. SHAPIRO (Belorussian NIIEOSKh [Scientific Research Institute of Economics and Organization of Agriculture]), G. I. TUKMAGAMBETOV (Kazakh NIIEOSKh), K. G. PETISH (Moldavian NIIEOSKhP [Scientific Research Institute of Economics and Organization of Agricultural Production]), A. YE. MATUSHKIN (Belgorod Agricultural Institute), L. L. Akopyan (Armenian NIIEOSKh), L. K. ULYBINA (Krasnodar NIISKh [Scientific Research Institute of Agriculture]), V. R. BOYEV, academician of VASKhNIL (Siberian NIIESKh), Yu. V. SEDYKH, deputy RSFSR minister of agriculture, and A. A. NIKONOV, academician of VASKhNIL.

The Presidium of VASKhNIL and Presidium of the All-Russian Department of VASKhNIL adopted a decree, "Intensification of Research for Scientific Support of Collective Contracts in Agricultural Enterprises." It notes that, being governed by the decisions of the May (1982) and subsequent plenums of the CPSU Central Committee, scientific research institutes have accomplished some positive results for scientific support of collective contracts in agriculture and providing scientific methodological assistance to agricultural bodies, kolkhozes and sovkhozes to introduce this practice. As a result of the steps taken by party, soviet and agricultural bodies, there has been a significant increase in number of contractual collectives at kolkhozes and sovkhozes. In 1982, 57,600 brigades and units operated by contract and in 1983 this applied to 153,000, including 100,000 collectives in plant growing, who worked on almost one-fifth of the fields.

The scientists of VNIESKh, VNIETUSKh and other institutes participated in elaborating the recommendations of the USSR Ministry of Agriculture for collective contracts in plant growing and the livestock industry. They have been approved by the Scientific and Technical Council of the USSR Ministry of Agriculture, USSR State Committee for labor and the AUCCTU, and have been printed in large number. On their basis, industry has been furnished with recommendations concerning collective contracts at sovkhozes and kolkhozes, as applied to local conditions. Scientific institutions are summarizing and disseminating information about the positive experience of contracted collectives, they offer practical scientific methodological assistance to agricultural bodies, kolkhozes and sovkhozes for introduction of this progressive form of organizing labor. Base farms have been attached to scientific institutions to refine standard models of contracted brigades and units, and they provide concrete assistance to these farms. The farms are changing into advanced knowhow schools; rayon and zonal conferences are held there, as well as seminars on collective contracting.

However, scientific support and the rate of introduction of collective contracts are not entirely consistent with the tasks put forth. Local agricultural bodies, kolkhozes and sovkhozes are experiencing difficulties in defining the optimum size of contract collectives, determining validated planned assignments, keeping records and implementing efficient supervision over the performance of such collectives and changing them to cost accounting. The methods of distributing advances on collective wages on the bases of end results of labor require improvement. There are no simple, scientifically substantiated recommendations to set differentiated norms for cost accounting assignments for kolkhoz and sovkhoz departments, determination of the intensity of these jobs aimed at the end result. Recommendations are needed for introduction of collective contracts in the area of repair of equipment, transportation and other jobs and agricultural services.

The Presidium of VASKhNIL and Presidium of the All-Russian Department of VASKhNIL adopted a decree, in which the Department of Economics and Organization of Agricultural Production at VASKhNIL (S. S. Sergeyev, academician of VASKhNIL), VNIESKh (Prof V. F. Mashenkov) and VNIETUSKh were asked to intensify research at head and coordinated scientific institutions concerning collective contracts in different environmental and economic production conditions for scientific methodological support of introduction of this method in conjunction with other elements of the management machinery; to expedite elaboration of recommendations on optimum size of contract collectives, standards for planning cost-accounting assignments (VNIETUSKh together with VNIIPINSKh [All-Union Scientific Research Institute of Planning and Standards in Agriculture]), proposals to upgrade record-keeping and accountability (Ukrainian NIIEOSKh), programs for combined experiments on collective contracts, intramural estimation, records and ongoing control in departments of base farms (VNIESKh, VNIETUSKh); to increase the role of experimentation in research on collective contracts and, for this purpose, ask the VNIESKh and VNIETUSKh to submit proposals on organizing experimental work for examination to the Presidium of VASKhNIL; ask the VNIESKh and VNIETUSKh to complete work on the plan of recommendations for collective contracts referable to agricultural trucking work; ask the Siberian NIIESKh, Kazakh NIIEOSKh, its Tselinograd affiliate and Volga affiliate of VNIETUSKh to prepare by 1 December 1984 a draft of recommendations dealing with material incentives for contract collectives working in the region of unstable agriculture; the VNIESKh, together with co-executor institutes, are to report on progress of extending collective contracting in sectors of agricultural production in different regions of the country, prepare and submit to the USSR Ministry of Agriculture proposals to refine labor organization and remuneration, paying special attention to optimization of the size of cost-accounting collectives and scientific validation of the index of labor participation; the head organizations responsible for topics pertaining to intrafarm accounting (VNIESKh) and collective contracting (VNIETUSKh) must improve coordination of research with co-executor institutes; the Department of Economics and Organization of Agricultural Production of VASKhNIL (S. S. Sergeyev, academician of VASKhNIL) and VNIESKh (Prof V. F. Mashenkov) were asked to convoke an All-Union scientific conference in October 1984 to report on experience gained and directions of improvement of investigations of collective contracts in agricultural and other sectors of the agroindustrial complex.

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At the next session, the Presidium of VASKhNIL discussed the performance of experimental farms of scientific production associations and scientific research institutes of VASKhNIL in 1983. It was noted that the experimental farms of scientific research institutions of VASKhNIL improved production conditions for experimental work, raising breeding material, refinement of new technology, development of pedigreed groups and lines of livestock. At many of the farms there were seminars to disseminate information about the advances of science and progressive knowhow. In 1983, work improved in the area of production and sale of superior seeds. Elite-seed farms are raising more than 400 cultivars and hybrids referable to 48 agricultural crops for the benefit of kolkhozes and sovkhozes. Fulfillment of plans for the sale of seeds was expressed by the following figures: 125% for grain crops, including 121% for leguminous ones; 115% for oil-bearing crops, 196% for potatoes and 122% for perennial grasses. Livestock farm indicators improved: the plan for sales to the government was 106% fulfilled for milk, 102% for meat and 119% for pedigreed young cattle. The cost of gross production on the fields and farms of experimental farms constituted 117.2 million rubles, which is 2% more than called for in the plan and 7% more than in 1982. Labor productivity increased by 8%. Profitability level constituted 33.6% and profit 45.4 million rubles.

At the same time, the Presidium of VASKhNIL mentioned the substantial flaws in the performance of some experimental farms with regard to providing optimum conditions for institutes to conduct scientific production experiments, introduce scientific achievements, train specialists and administrators for kolkhozes and sovkhozes. Several of the experimental farms of VSGI [All-Union Institute of Breeding and Genetics], Mironovskiy Scientific Research Institute of Wheat Breeding and Seed Growing did not fulfill the plan for grain crop seed sales, the VIUA [All-Union Scientific Research Institute of Fertilizers and Soil Science] failed to fulfill the plan for perennial grass seeds. Two farms (VSGI and Maritime affiliate of the All-Union Scientific Research Institute of Rice) ended 1983 with a loss. Some scientific research institutes are still not devoting enough attention to development of the material and technical base of experimental model farms. Full use is not being made of fixed and circulating production funds; progressive forms of organization and payment of labor are being introduced slowly. The GSM [expansion unknown] are also breaking rules for conservation of agricultural equipment. The decree adopted by the Presidium of VASKhNIL on 26 August 1982, "Status and Steps to Improve Seed Growing at Experimental Farms of Institutes in the VASKhNIL system," is not being implemented to its full extent.

The Presidium of VASKhNIL has made it incumbent upon regional and sectorial departments of VASKhNIL to improve management of experimental farms, provide conditions for research, dissemination of scientific advances and advanced knowhow, as well as implementation of plans for economic and social development in 1984 and the current five-year plan as a whole. The administrators of scientific production associations and scientific research institutes must derive the appropriate conclusions from the results of the work of experimental farms in 1983, providing for steps to improve their production and financial activities. The directors of scientific production associations and scientific research institutes must do the following:

Intensify and specify work to improve organization of introduction of advances in science, technology and advanced knowhow, attributing special significance to accelerated reproduction of new, highly productive cultivars and farm crop hybrids.

Plan expansion at experimental and test farms of areas for new cultivars and hybrids with use of industrial technologies to raise them.

Introduce on a broad scale progressive forms of organizing labor and offering material incentives for experimental model farm workers, paying special attention to refinement of departmental work on the basis of collective contracts.

Take additional steps to complete development and introduction to experimental farms under their jurisdiction of systems of farming, fulfilling plans for pedigreed breeding work with dairy cattle.

Increase the efficiency of using fixed and circulating production capital, provide for a reduction in cost of agricultural production, further growth of labor productivity and profitability of experimental farms.

Implement regular supervision of introduction and improvement of intrafarm accounting, intensification of conservation practices.

Take effective steps to strengthen the material and technical base of experimental farms, as well as its fuller utilization for scientific production purposes.

Implement fulfillment of production plans and development of seeds from highest quality crops, cultivars and hybrids; inspect quality of seeds allocated to kolkhozes and sovkhozes.

Render constant practical assistance to experimental farms for proper wintering of cattle, plantations, care of plantations and harvesting.

Establish permanent control over fulfillment of the plan of measures to improve seed growing, which was approved by the Presidium of VASKhNIL on 26 August 1982.

The Presidium of VASKhNIL has made it incumbent upon the Economic Planning Administration to regularly assist scientific research institutes and their experimental farms in fulfilling the plans for economic and social development, and plans for introduction of scientific achievements and advanced knowhow, which have been elaborated for 1984 and the current five-year plan as a whole; to effect, together with scientific research institutes of VASKhNIL, economic analysis of performance of experimental farms and prepare suggestions for improving the efficiency of using fixed and circulating production funds. The financial accounting and auditing administrations must provide in 1984 for an inspection of the status of bookkeeping and integrity of material-technical and financial resources of experimental farms of VASKhNIL institutes.

At the meeting of the Presidium of VASKhNIL, there was discussion of the status of development and introduction of progressive technologies for production of perennial grass seeds on an industrial basis. After hearing and discussing the paper delivered by A. S. NOVOSELOVA, chief of breeding center at the All-Union Scientific Research Institute of Feed imeni V. R. Vil'yams, doctor of agricultural sciences, the Presidium of VASKhNIL observed that the above-mentioned institute and scientific research institutions it coordinates have accomplished some work to perform the assignments in the integrated scientific technical program entitled "Development and Introduction of Technological Process for Production of Leguminous, Grain Grass and Other Feed Crop Seeds on an Industrial Basis." The scientific research institutions of our country have developed zonal technologies for raising seeds of alfalfa, clover and the main grain grasses; they have made proposals for organizing specialized seed-growing farms dealing with perennial grasses, measures to develop commercial seed growing of alfalfa at special farms in Kirghiz SSR and Chechen-Ingush ASSR for delivery of seeds to farms in the Nonchernozem region. Technologies for production of perennial grass seeds are being introduced actively in several oblasts of RSFSR, Ukrainian and Belorussian SSR. Heeding the scientific recommendations, the farms in Kirghiz SSR have augmented alfalfa seed production and delivered, in 1983, more than 4000 tons of seeds, instead of the planned 2500 tons, to zones of unstable seed growing.

At the same time, planning of a set of machines for sowing, harvesting and post-harvesting processing of perennial grass seeds is slow. It is imperative to intensify studies dealing with organizational and economic aspects of feed crop seed growing, development of zonal systems for protection of perennial grass plantations being raised for seeds against pests, diseases and weeds. In many regions and farms, problems of material and technical support of perennial grass seed growing are being solved unsatisfactorily. Several scientific research institutes (VNIIMK [All-Union Scientific Research Institute of Oil-Bearing Crops], Mironovskiy NIISSP [Scientific Research Institute of Wheat Breeding and Seed Growing], VIUA, VNIALMI [All-Union Scientific Research Institute of Conservational Afforestation]) have not fulfilled the delivery plans for highest grade perennial grass seeds. Studies have not been completed on development of technologies for production of seeds of different cultivars that are being pursued at the Kazakh NIILPKh [typo for Scientific Research Institute of Forestry Problems?], Kirghiz NITIPK [expansion unknown], Georgian NIIZ [Scientific Research Institute of Grain and Grain Products], Armenian NIIZ and North-East NIISKh.

The Presidium of VASKhNIL decreed the following: The Department of Feed Production (I. P. Proskura, corresponding member of VASKhNIL), Department of Plant Protection (N. M. Golyshin, corresponding member of VASKhNIL), regional departments of VASKhNIL together with the All-Union Scientific Research Institute of Feed imeni V. R. Vil'yams and co-executor institutes must implement mandatory fulfillment of the plan of scientific research to develop zonal technologies for perennial grass seed production, paying special attention to economic-organizational aspects of seed growing, combined investigations of reproduction and optimum use of pollinating insects, protection of seed plantations against pests, diseases and weeds, improved coordination and higher methodological quality of work.

The Department of Mechanization and Electrification of Agriculture (G. Ye. Listopad, academician of VASKhNIL), Department of Feed Production (I. P. Proskura, corresponding member of VASKhNIL), together with the All-Union Scientific Research Institute of Feed imeni V. R. Vil'yams, must prepare suggestions for accelerated development of machinery for cultivating, harvesting and postharvesting processing of perennial grass seeds, as well as small equipment for scientific research and seed production on the level of primary seed growing.

The Eastern, Central Asian and Transcaucasian departments of VASKhNIL are to inspect the performance of the Kazakh NIILPKh, Kirghiz NITIPK, Georgian NIIZ, Armenian NIIZ and Azerbaijan Scientific Research Institute of Feed, Meadows and Pastures, and take necessary steps for prompt development of industrial technologies for perennial grass seed production in their zones. They are also to implement a production trial and introduction of progressive technologies to seed-growing farms.

The Department of Feed Production, Department of Plant Growing and Breeding and regional departments of VASKhNIL must organize scientific production associations for the highest grade perennial grass seeds on the basis of zonal institutes and oblast experimental agricultural stations.

Considering the exceptionally important role of proper use of bees in augmenting seed productivity of alfalfa and clover, it is recommended to the All-Union Scientific Research Institute of Feed imeni V. R. Vil'yams, together with other co-executor scientific institutions, that they provide additional development of sections of industrial technology for production of seeds of these crops with use of pollinating insects.

The USSR Ministry of Agriculture will be asked to take additional steps for development of apiculture, protection of naturally occurring entomofauna and wise use of bees for pollination of agricultural crops.

The USSR Ministry of Agriculture, USSR State Committee for Farm Equipment and Ministry of Machine Building for Livestock Industry and Fodder Production will be asked to provide for priority delivery to experimental grass farms of special, high-powered farm machinery, desiccants and herbicides for speedy introduction of technologies for raising feed crop seeds on an industrial basis.

At one of the meetings, the Presidium of VASKhNIL discussed the outcome of annual general meetings of sectorial departments of VASKhNIL (23-27 April 1984) and observed that the visiting annual general meetings of sectorial departments of VASKhNIL were held on a high methodological and scientific level. The papers and speeches of participants concentrated mainly on fulfilling the tasks put to agricultural science by the April (1984) Plenum of the CPSU Central Committee and All-Union Economic Conference on Problems of the Agroindustrial Complex. In addition to reports concerning performance of the departments in 1983, there was delivery and discussion of papers by scientists, which dealt with the most pressing problems of modern science, as well as reports of individual academicians and corresponding

members of VASKhNIL. More than 1000 scientists and specialists in agricultural and other sectors of the agroindustrial complex attended the annual meetings of sectorial departments of VASKhNIL. More than 150 people participated in discussing papers, including 34 academicians and 36 corresponding members of VASKhNIL. The scientists became acquainted with the work of several laboratories of institutes situated at the sites of the annual meetings (Minsk, Kiev, Alma-Ata, Gorkiy, Volgograd and others).

The Presidium of VASKhNIL gave a positive rating to the work on preparing and holding the visiting annual general meetings of sectorial departments. It instructed the newly elected Office of Sectorial Departments to concentrate the efforts of subordinate scientific research institutes, as well as co-executors of scientific and technological programs on performing the tasks of the 11th Five-Year Plan and preparing combined programs for the 12th Five-Year Plan; it is to pay special attention to fulfillment of tasks spelled out at the April (1984) Plenum of the CPSU Central Committee and All-Union Economic Conference on Problems of the Agroindustrial Complex. The administrators of sectorial departments of VASKhNIL are to summarize the suggestions offered at annual meetings by scientists and specialists, and set dates for their implementation; they should obtain greater effectiveness of research and faster introduction of scientific achievements to industry.

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CSO: 1840/1006

UDC 591.044.3:581.112.4:582.542.1

ULTRASTRUCTURE OF CELLS, RESPIRATION AND PHOTOSYNTHESIS OF WINTER WHEAT LEAVES GROWN IN CONTROLLED ENVIRONMENT AT VARIOUS TEMPERATURES

Leningrad TSITOLOGIYA in Russian Vol 26, No 6, Jun 84
(manuscript received 9 Jun 83) pp 672-677

MIROSLAVOV, Ye. A., KISLYUK, I. M. and SHUKHTINA, G. G., Botanical Institute, USSR Academy of Sciences, Leningrad

[Abstract] The physiology of plants acclimated to low temperatures has received wide attention, but no correlation has been made between submicroscopic structural changes and low temperature growth processes. The present article reports on a study of this type. Triticum aestivum L of the strain Mironovskaya 808 was grown at 25/15°C or 10/-1°C temperatures with 80% humidity and other controlled parameters. Then potential photosynthesis was assessed. Results showed that the primary leaf at the higher temperatures appeared in 12 days, while that of the wheat, sprouted at 10/-1°C, appeared only after 30 days and was only half the length of the primary leaves sprouted in warm conditions. The number of dictyosome and peroxysome malformations also increased in the low temperature plants, as did chlorophyll content. Respiration intensity and photosynthesis at saturation levels of CO_2 were also elevated. Thus a sufficiently high level of metabolism was maintained at low temperatures. Figures 4; references 19: 10 Russian, 9 Western. [849-12131]

UDC: 632.4:633.11:582.285.2

WHEAT AND OAT RUST IN ETHIOPIA. REPORT 3. RACE AND GENOTYPE COMPOSITION OF BROWN AND STEM WHEAT RUST

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 18, No 3, May-Jun 84 (manuscript received 28 May 82) pp 234-239

DMITRIEV, A. P., All-Union Institute of Plant Protection, Leningrad

[Abstract] A study of the composition of wheat rust in Ethiopia was undertaken in 1979-1981. The racial composition of brown and stem rust was

studied in 1979. Ten races of stem rust of wheat were recorded. Thirteen races of brown rust were found. They differed from rusts in other countries in their specific composition, great heterogeneity and generally low virulence. None of the genes studied can be used as a source of resistance to the disease in Ethiopia. Brown rust in Ethiopia, differing in a number of characteristics from the rust in other countries, is similar in some ways to Dagestan rust. This is because of intrapopulation processes inherent in areas offjoint evolution of parasite and host. References 16: 4 Russian, 12 Western.
[1586/6508]

UDC: 632.938:582.288.42:633.511

RESISTANCE FACTORS OF VARIOUS COTTON SPECIES AGAINST VERTICILLIUM WILT

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 18, No 3, May-Jun 84 (manuscript received 18 Apr 83) pp 239-245

MATVEYEV, G. G. and ZHURAYEV, K., Andizhan Branch, All-Union Scientific Research Institute of Cotton Growing imeni L. V. Rumshevich, Leninsk

[Abstract] A broad assortment of specimens from the world cotton collection is available for study at the author's institute. The method of raising vegetative interspectific grafts with a pathogen in the infectious background differing in race composition under field conditions was used to study wilt resistant factors. The experiment included 5 specimens of different varieties of cotton. The resistance of these species results from various factors, including resistance of the root system to propagation of the pathogen, humoral resistance to the pathogen, resistance of the above-ground portion of the plant and humoral resistance to both races of pathogen tested. The types of cotton with humoral resistance facilitate acquisition of wilt resistance. Growing of cotton varieties with race-specific resistance causes primary accumulation in the soil of the physiological race of wilt pathogen virulent to the species. Growing of wilt-resistant varieties of cotton does not cause differentiated selection and accumulation of any particular race of the pathogen in the soil. References: 15 Russian.
[1586/6508]

UDC: 542.952+577.154.2

IMMOBILIZATION OF GLUCOSOISOMERASE BY IN VACUO ADSORPTION ONTO POROUS SILOCHROME

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 4, Jul-Aug 84 (manuscript received 15 Mar 83) pp 458-463

ANANICHEV, A. V., ULEZLO, I. V. and REZCHIKOV, A. A., Moscow State University; Institute of Biochemistry imeni A. M. Bakh, USSR Academy of Sciences, Moscow

[Abstract] A study is made of the possibility of increasing the quantity of adsorbed protein, instability, activity and period of inactivation by adsorption of glucosoisomerase on macroporous silochrome in a vacuum. Additional treatment with a tannin solution was used to prevent washing of the adsorbed enzyme from the pores of the carrier, leading to formation of associates more firmly adsorbed in the pores of the carrier. Additional bonding of protein molecules was achieved by a treatment with glutaraldehyde. Simple adsorption of homogeneous and semipurified glucosoisomerase in a vacuum did not achieve satisfactory results. The data show that glucosoisomerase preparations adsorbed in a vacuum onto macroporous non-aminated silochrome and stabilized by subsequent treatment with tanning and glutaraldehyde allow development of methods for production of immobilized preparations suitable for use in industrial reactors for production of glucosofructose syrup. References 12: 3 Russian, 9 Western.
[811-6508]

UDC: 543.257/088.8/

IMMOBILIZATION OF GLUCOSOOXIDASE IN COATING OF POLYVINYL ALCOHOL

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 4, Jul-Aug 84 (manuscript received 21 Feb 83) pp 464-466

BELOZEROVA, O. A., ZYTNER, Ya. D., TIKHONOVA, L. S., GALUSHKIN, A. N. and MAKAROV, K. A., First Leningrad Medical Institute imeni I. P. Pavlov

[Abstract] The purpose of this work was to study the possibility of immobilizing glucosooxidase in a coating of polyvinyl alcohol formed directly on the

surface of an electrode as a result of electrodeposition of polyvinyl alcohol. Glucosooxidase from Penicillium vitale was used on a coating produced on the surface of metal with an aqueous solution containing polyvinyl alcohol and boric acid H_3BO_3. The enzyme was preliminarily dissolved in 0.9% NaCl, then introduced to the PVA and H_3BO_3 solution. The mass of the coating was determined by the difference in mass of the electrode before and after polymer coating. The study showed the possibility of rapid production of a coating of regulated thickness from polyvinyl alcohol containing immobilized glucosooxidase directly on the electrode. Figures 2; references 5: 4 Russian, 1 Western.
[811-6508]

UDC: 577.165+577.150

SOME SPECIFICS OF IMMOBILIZATION OF ACID PROTEINASE FROM ASPERGILLUS AWAMORI USING GLUTARALDEHYDE

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 4, Jul-Aug 84 (manuscript received 3 Nov 82) pp 467-472

MOTINA, L. I., BORISOVA, V. N. and NAKHAPTEYAN, L. A., All-Union Scientific Research Biotechnic Institute, Moscow

[Abstract] The purpose of this work was to develop a method of immobilizing enzymes on amine-containing carriers without the shortcomings of presently used methods. Acid proteinase from Aspergillus awamori was used. The proteolytic activity of the initial and immobilized enzyme was determined on a substrate of a 1% solution of sodium caseinate. Immobilization was performed on silochrome S-80 with specific surface 80 m^2/g, pore diameter 400-600 Å containing 0.22-0.24 mg·eq amino group per gram of silochrome. The cross-linking agents used were 25% aqueous solutions of glutaraldehyde provided by various firms, malonic aldehyde tetramethylacetal, glutaraldehyde tetrabutylacetal and glutaraldehyde polymer. The use of the aldehyde acetals as cross linking agents provides a convenient method for immobilization of the enzymes allowing elimination of shortcomings inherent in methods using glutaraldehyde alone. Figures 2; references 15: 5 Russian, 10 Western.
[811-6508]

UDC: 577.112.854

USE OF IMMOBILIZED ORANGE DYE TO PURIGY NAD(P) REDUCTASE OF RHODOPSEUDOMONAS CAPSULATA

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 4, Jul-Aug 84 (manuscript received 12 Jan 83) pp 560-564

LAURINAVICHENE, T. V., AGAKISHIYEV, A. G. and GOGOTOV, I. N., Institute of Soil Science and Photosynthesis, USSR Academy of Sciences, Pushchino

[Abstract] The purpose of this work was to estimate the effectiveness of adsorbents based on domestic dyes for purification of NAD(P) reductase of Rhodopseudomonas capsulata. Traditional multistep purification methods have been found unsuitable due to the lability and low content of the enzyme in the cells of R. capsulata. Continuous cultivation of R. capsulata was performed on Ormerud medium with lactate. The cells were precipitated in a centrifuge and stored at -20°C. Acid hydrolysis hsowed that 1 ml of agar gel contained about 0.6 mg of bonded dye. Its capacity for unpurified NAD(P)-reductase is 500-1000 units of activity per ml of gel. The use of orange gel as one of the stages in purification allows improvement of the method of purification and production of active homogeneous enzyme preparations. The availability of the components and simplicity of synthesis of the adsorbents allows them to be considered quite promising for purfication of analogous enzymes for other organisms. Figures 2; references 14: 4 Russian. 10 Western.
[811-6508]

UDC: 576.85

BIOLOGIC AND NUTRIENT VALUE OF HYDROGEN BACTERIA BIOMASS

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 4, Jul-Aug 84 (manuscript received 20 Jan 83) pp 540-550

TERSKOV, I. A., GITEL'ZON, I. I., SID'KO, F. Ya., OKLADNIKOV, Yu. N., TRUBACHEV, I. N., FEDOROVA, Ya. V., VOLOVA, T. G. and POPOV, N. I., Institute of Biophysics, Siberian Department, USSR Academy of Sciences, Krasnoyarsk

[Abstract] The authors' institute has created technological regulations for experimental production of hydrogen bacteria biomass, determined the kinetic growth rates of productivity as functions of physical and chemical parameters of the medium, and consumption coefficients for all growth substrates. It has also studied the interactions of the producing and accompanying microflora under conditions of nonsterile fermentation. Based on these studies an installation has been created and has been used to develop experimental runs of biomass. This article compares some of the growth in disease of hydrogen and methane-oxidizing microorganisms, showing the great simplicity,

stability and effectiveness of the process of biosynthesis in hydrogen and confirming the promise of this new technology for the microbiological industry. This article presents results of studies confirming the high biological value of the biomass of hydrogen bacteria. All studies were performed with the bacteria Alkaligenes eutrophus Z-1 isolated in 1968. With sufficient quantities of oxygen, hydrogen and carbon dioxide in the gas phase, the primary biochemical components synthesized in the cells are proteins. The proteins of hydrogen bacteria contain all of the essential amino acids, which represent 40% of the total amino acids. The total protein content is 50% greater than in yeasts. The relative nutrient value of hydrogen bacteria is 115% in relationship to casein, increasing to 121% after disintegration. The variety of physiological and biochemical properties of hydrogen bacteria determines the variety and importance of potential capabilities for their practical use. References 41: 35 Russian, 6 Western. [811-6508]

UDC: 616.61-018.1-008.94:577.175.859]-02:612.014.45

INFLUENCE OF VIBRATION OF BIOSYNTHESIS OF PROSTAGLANDINS IN TISSUES

Moscow FARMATSIYA in Russian Vol 33, No 4, Jul-Aug 84
(manuscript received 1 Mar 84) pp 20-21

USTYNYUK, T. K., BRAGINTSEVA, L. M. and TIMOFEYEV, Yu. M., First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] A report is presented on spontaneous biosynthesis of prostaglandins in the process of homogenization of living tissue in vitro. Sheep glands containing an enzyme system necessary for biosynthesis of prostaglandins and rich in arachidonic acid were studied. An increase in the quantity of prostaglandins was observed: PGE_2 to 0.5 mg per gram of tissue and $PGF_{2\alpha}$ up to 0.2 mg per gram of tissue. Industrial vibration may cause an increase in spontaneous biosynthesis of prostaglandins in certain organs and tissues, which may be the basis of pathogenesis of certain occupational diseases. References 4: 1 Russian, 3 Western.
[1604-6508]

BIONICS

BRIEF

EYES FOR COMPUTERS--A computer will be able to discern objects, their color and quality if a model of an eye, which was developed by Tajik scientists, is installed in it. The idea of reproducing an eye similar to a living one came to Ruslan Osherov, senior scientific associate at the Institute of Astrophysics, Tajik Academy of Sciences, while viewing heavenly bodies. Being interested in problems of photometry of comets, he repeatedly became convinced that photographic plates and precision instruments that fix objects in space, though effective, cannot replace real sight. They cannot react rapidly to changes in brightness and range of comet travel. Expressly this is important to the study of rapid internal processes in comets. Only the organ of sight, combined with a telescope and computer, is capable of rapid readjustment. This complicated technical problem was solved by the astrophysicist, together with a biologist, Mikhail Tadzhikov, docent at the Tajik State Medical Institute imeni Abu-Ali Ibn-Siny. They developed a functional model of the eye using materials with the same light refraction features and other properties inherent in living matter. The device has a distinctive pupil and light guides transmitting an image on a television screen serve as the retina. In medicine, this is an instrument for prognostication of several eye diseases. Changes affecting formation of object images are well-simulated in the model. Incidentally, the inventors are not setting any limits to the capabilities of their model. They believe that the same principle can be followed to develop a "dolphin eye": a machine that will be able to see well under water and everything happening on its surface. This opinion is based on abundant experience in bringing technical ideas to life. Astrophysicist R. Osherov has received 15 author certificates for development of instruments and devices in current use in science and industry. [By L. Pil'man (Tajik News Agency)] [Text] [Dushanbe KOMMUNIST TADZHIKISTANA in Russian 5 Sep 84 p 3] 10,657

CSO: 1840/824

MODELING OF HUMAN MOTION BY COMPUTER CONSIDERING MEASUREMENT ERRORS IN INITIAL DATA

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 29 Aug 83) pp 694-695

ZINKOVSKIY, A. V. and CHISTYAKOV, V. A., Leningrad Polytechnical Institute imeni M. I. Kalinin

[Abstract] An analysis is presented of the statistical characteristics of joint moments when there are errors in the mass-inertia characteristics of a biomechanical system, errors arising upon recording and computation of the kinematics of motion, and statistical characteristics of the synthesized motion on a computer when there are errors in joint moments which appear due to the finite word length of the digital computer. Assuming randomness and independence of errors in determination of the inertial tensors, the dispersions of errors in joint moments are found. With errors arising due to inaccurate knowledge of kinematics of the moving biomechanical system, a method of Gaussian approximation is used to filter errors of measurement. [1584-6508]

BIOPHYSICS

VARIATION IN PHOTOSYNTHESIS WITH LIGHT LEVEL FOR MODEL WITH TWO PHOTOCHEMICAL REACTIONS

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 10 Jun 83) pp 542-547

ZVALINSKIY, V. I. and LITVIN, F. F., Institute of Marine Biology, Far-Eastern Scientific Center, USSR Academy of Sciences, Vladivostok; Department of Biology, Moscow State University imeni M. V. Lomonosov

[Abstract] An earlier work suggested a model describing the variation in rate of photosynthesis for one of two reactions as a function of light intensity considering the influence of the different organization of photosynthetic units and the limiting dark reaction accompanied by a reaction center cycle. In this work, this approach is extended to allow analysis of the light dependence of photosynthesis considering both photochemical reactions. Analysis of the model presented leads to a number of new conclusions which could not be predicted with simpler one-reaction models. The shape of the light curve is independent of the location of the link which limits the speed of the dark reaction with respect to the two light reactions. It is determined only by the relative resistance of this link with respect to the total resistance of dark reactions in the reaction center cycles. The form of the light curves should depend on the degree of interaction of the two photosystems, that is, the degree of balance of excitation of the two photosystems. The form of the light curve should depend on the spectral composition of the light. Figures 4; references 17: 8 Russian, 9 Western. [1584-6508]

INFLUENCE OF POLARIZABILITY OF CHARGED GROUPS OF BIOLOGICAL AND ARTIFICIAL MEMBRANES ON SPECIFIC ADSORPTION OF MONOVALENT CATIONS

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 23 Dec 82) pp 628-632

TSYBUL'SKAYA, M. V. and YAGUZHINSKIY, L. S., Interfaculty Problem Scientific Research Laboratory of Molecular Biology and Bio-Organic Chemistry imeni A. N. Belozerskiy; Moscow State University imeni M. V. Lomonosov

[Abstract] Earlier articles have reported the participation of alkali metal cations in the operation of oxidative phosphorylation enzymes. This work describes an effect of specific bonding of alkali metal cations with the internal mitochondrial membrane and its influence on the basic functions of the mitochondria--the speed and effectiveness of operation of the enzymes of the oxidation and phosphor relation process conjugation system. Liberation of mitochondria from the liver of male white rats was performed by a standard method in a saccharose solution with EDTA. Potassium cations were removed from the mitochondrial matrix by addition of nigericine, then double washing was performed and the rate of mitochondrial respiration measured at room temperature. The parameter ADP/O was measured by two independent methods. It was found that the interaction of ions measured in homogeneous and heterogeneous systems is identical, allowing a new approach to the problem of the nature of the chemical bond in specific adsorption of cations on to a negatively-charged phase division boundary such as the surface of biological membranes. Specific adsorption of alkali metal cations occurs on protein groups whose properties correspond to those of easily polarized Lewis bases. The specific adsorption effect controls the rate of operation of enzymes of the oxidative phosphor relation group and the effectiveness of conjugation of oxidation and ATP synthesis. Figures 2; references 29: 13 Russian, 16 Western.
[1584-6508]

IMPREGNATED FILTERS AS MODEL OF BIOLOGICAL MEMBRANES

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 6 Jan 83) pp 624-627

KOCHERGINSKIY, N. M., OSAK, I. S. and MOSHKOVSKIY, Yu. Sh., Scientific Research Institute for Biological Testing of Chemical Compounds, Kupavna (Moscow Oblast)

[Abstract] The electrochemical characteristics of nitrocellulose 'sinpor' ultrafilters saturated with isobutyl laurate are described. Due to the polar head and fatty acid chain this solvent can be considered a model of neutral lipids. The filters were saturated by immersing them in isobutyl laurate after which they were squeezed in a circular clamp and placed in a thermostatted measurement cell. The artificial membrane filter divided the cell into two different parts each 8 ml in volume. The pH was measured

continuously on both sides of the filter. The electrical characteristics of the membrane filters are found to correspond to those of biological membranes. The same correspondence was observed when the saturating agent was liquid vegetable lipids such as castor oil. The biological membrane model suggested here can be used to study the physical and chemical mechanisms of action of membranotropic biologically active compounds. Figures 3; references 24: 1 Russian, 23 Western.
[1584-6508]

DIAGNOSIS OF STABILITY OF PLANT CELLS AT LOW TEMPERATURES BY PULSED NUCLEAR MAGNETIC RESONANCE

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 7 Jul 83; after revision 30 Oct 83) pp 666-669

ANISIMOV, A. V. and IONENKO, I. F., Kazan' Institute of Biology, Kazan Branch, USSR Academy of Sciences

[Abstract] A direct method is suggested for determining the threshold temperature of destruction of membranes from the jump in effective self diffusion coefficient of water in the volume of tissue measured by pulsed nuclear magnetic resonance. Roots and leaves of Mironovskaya-808 wheat, seven days of age, grown in an artifical solution at 22°C with 12 hour photoperiod were used in the demonstration. The results indicate that a jump in D_{eff} and T_1 at -5°C is a sign of membrane breakdown. Figures 3; references 12: 7 Russian, 5 Western.
[1584-6508]

BIOPHYSICAL ASPECTS OF ACTION OF PHYSICAL AND CHEMICAL FACTORS ON LIVING ORGANISMS. PROTECTIVE PROPERTIES OF ANTIOXIDANTS

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 29 Jun 83) pp 706-719

EMANUEL', N. M., Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] A study is reported of pre-radical biochemical changes occurring in living organisms under the influence of various physical and chemical environmental factors. Detection of these phenomena leads to the conclusion of presence of radically new possibilities for eliminating undesirable changes by the action of low toxicity radical reaction inhibitors, particularly antioxidants. Factors against which antioxidants can provide protection include ionizing radiation, light, heat, noise and harmful chemicals. Oxidants, as pre-radical process inhibitors, can prevent or neutralize harmful changes to living systems resulting from exposure to these environmental factors. Figures 10; references: 43 Russian.
[1584-6508]

HYDRATION AS PARAMETER FOR DETERMINING DIFFERENCES AMONG VARIETIES OF WHEAT GRAINS

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 27 Oct 83) pp 690-692

SHCHEGOLEVA, T. Yu., Institute of Radiophysics and Electronics,
Ukrainian SSR Academy of Sciences, Kharkov

[Abstract] Hydration numbers of omega are presented for specimens of several varieties of wheat grains. The experiment was performed on grain samples ground to less than 10 μm in diameter. A table presents hydration numbers for six varieties of wheat, plus their general varietal characteristics and error in determination of omega. It is found that the maximum quantity of bonded water is contained by varieties more resistant to changes in the environment. The method allows reliable determination of varietal differences in wheat based on dielectric characteristics of ground grains.
Figures 1; references: 4 Russian.
[1584-6508]

BRIEF

POLITICAL EDUCATION DAY--There are flasks, retorts and instruments blinking their lights... It would appear to be a strictly scientific environment.... We are at the All-Union Scientific Research Institute of Protein Biosynthesis (Zhdanovskiy Rayon). Talks were held there within the limits of the unified political education day, which was held yesterday in all rayons of the capital. "We prepared for this day carefully," states Ya. Ya. Shkop, party committee secretary. "We worked out an approximate outline for the talks and a special schedule showing which administrator is to speak and where. The staff of all divisions and departments participated with much incentive in the unified political education day...." One of the talks was held in the laboratory of technology of products of microbiological synthesis. There, R. V. Katrush, institute director, spoke: "Our entire team," he stressed, became actively involved in the competition under the slogan of '40th Anniversary of the Great Victory--40 weeks of shock labor.' As it is known, our work is directly related to implementation of the Food Program. For example, a technology was developed at the institute, which is being used by the microbiological industry to put out hundreds of thousands of tons of feed supplement. And every ton of this supplement makes it possible to save quite a bit of feed grain at the farms. The labor watch, which reminds us of the feat of Soviet people during the Great Patriotic War, compels each one to work for maximum return. Growth of welfare of our people and, ultimately, preservation of peace on our planet, depends primarily on this." In the course of the talk, senior scientific associate G. T. Orekh stated: "Our laboratory is also trying not to get behind. In the two weeks that have elapsed since the start of the memorial watch, we completed assignments ahead of the target date with regard to a batch of so-called microbial oil, on the basis of which one can produce drugs. It can also be used to replace scarce precious foodstuffs, for example, codliver oil. We shall finish another project before the end of the year, also ahead of the target date." During the talks and meetings, the capital's workers discussed pressing problems in the life of their groups, posed concrete questions to their supervisors concerning improvement of working, living and recreational conditions; they checked whether promises made had been kept, came up with various suggestions. They spoke of their unanimous support of the domestic and foreign policy of the CPSU, and Soviet government; they voiced their firm determination to consistently increase labor productivity, strengthen discipline and do everything they can for further strengthening of the might of their homeland. [Text] [Moscow MOSKOVSKAYA PRAVDA in Russian 15 Aug 84 p 1] 10,657

EPIDEMIOLOGY

UDC: 616.98:578.833.26]-036.21(571.1/.5)

CHARACTERISTICS OF CAUSES OF DIFFERENT EPIDEMIOLOGIC MANIFESTATION OF TICK-BORNE ENCEPHALITIS FOCI IN WESTERN SIBERIA AND FAR EAST

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 4, Apr 84 (manuscript received 13 Jul 83) pp 46-48

PUSTOVALOVA, V. Ya. and KATIN, A. A., Tyumen' Scientific Research Institute of Regional Infectious Pathology

[Abstract] A study is presented of certain biological properties of strains of tick-borne encephalitis virus isolated from ticks collected in Western Siberia and the Far East. The infection risk is determined in a number of encephalitis foci in these areas. The virulence of 92 strains of tick-borne encephalitis virus for white mice was studied. The viruses were isolated from Ixodes persulcatus collected in Western Siberia and I. persulcatus and Haemaphysalis concinna collected in Primorskiy Kray. The virus strain, isolated from ticks collected in various parts of the area of infection which differed significantly in severity of the disease, did not in fact differs invirulence under the experimental conditions. The specifics of manifestation of the epidemic process in infectious foci are apparently determined not by biological properties of the pathogen, but rather by epizootic process specifics as a result of the high level of latent immunization of the population. References: 14 Russian. [1528-6508]

UDC: 578.821.5.083.3(672.4)

SEROLOGIC EXAMINATION OF CONGO REPUBLIC POPULATION FOR ORTHOPOX VIRUS ANTIBODIES. REPORT II. SPECIFIC IDENTIFICATION OF ANTIBODIES BY SOLID PHASE IMMUNOENZYME METHOD

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 4, Apr 84 (manuscript received 24 Jul 83) pp 64-67

MAL'TSEVA, N. N., MARENNIKOVA, S. S., NAKANO, J. (USA), MATSEVICH, G. R., KHABAKHPASHAYEVA, N. A., SHELUKHINA, E. M., ARITA, I., GROMYKO, A. I. and STEPANOVA, L. G., Moscow Scientific Research Institute of Viral Preparations, USSR Ministry of Health

[Abstract] The task of the present work was differentiation of antibodies for monkey pox and vaccinia. The solid phase immunoenzyme method (ELISA) was

used with preliminary adsorbed sera (ELISA-adsorption). Sera studied were from three regions of the Congo Republic from children 3 to 15 years of age with no traces of the vaccination against smallpox, since vaccination had been discontinued before they were born, but who upon initial examination were found to have antibodies in titers of at least 1:180. It is demonstrated to be possible to identify the species of antibodies to closely related orthopox viruses by the method used. No proof of circulation of the monkey pox virus among populations of the three regions studied was developed. In 62% of cases the presence of antibodies resulted from vaccine virus, indicating the continuing practice of vaccination in the Congo republic. In 38% of cases the antibodies differ from antibodies caused by vaccine viruses and monkey pox. Further studies are required to determine their nature. References 3: 1 Russian, 2 Western.
[1528-6508]

UDC: 579.843.1.083.12

QUANTITATIVE PARAMETERS OF SURVIVAL TIME OF VIBRIO ELTRO IN CERTAIN HOUSEHOLD OBJECTS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNIBIOLOGII in Russian
No 4, Apr 84 (manuscript received 13 Jul 83) pp 53-55

NOVIKOV, D. N., LOBANOVA, L. N., MEDINSKIY, G. M. and NEPOMNYASHCHAYA, N. B.,
Scientific Research Antiplague Institute, Rostov-na-Donu

[Abstract] A study was performed to establish quantitative parameters of the survival rate of V. eltor in certain household objects. The strain Ogawa number 3119 isolated in 1970 from a cholera patient was used. This strain is typical in morphologic, cultural and biologic properties. The surfaces of test objects quite typical of the domestic objects (painted wood, plastic, iron, ceramic) measuring 10 x 10 cm received a suspension of a 3 to 5 hour agar culture of V. eltor in human stool cultures. The stool specimens were not sterilized before use. Survival time of V. eltor was found to be 2.5 times longer in the dark and when proteins were present in the materials contaminated with the vibrions. When protein was added (as in the feces of a cholera patient) V. eltor survives 4,6 times longer than when contaminated by feces without protein as in a carrier. Objects contaminated with the feces of cholera patients are therefore much more dangerous. References 13: 6 Russian, 7 Western.
[1528-6508]

UDC: 616.36-002.022:578.891]-022.3(048.8)

NATURAL PATHS OF PROPAGATION OF VIRAL HEPATITIS B

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 84 (manuscript received 31 May 83) pp 12-17

GERASHUN, B. A., L'vov Medical Institute

[Abstract] This is a review-paper. When sensitive methods of identification of the Australia antigen appeared, it was found to be contained not only in blood but also in the urine, sputum, sweat, menstrual blood, vaginal contents, as well as other secretions and effusions of the body. It was concluded that in addition to parenteral, there are also fecal-oral and air-drop mechanisms of infections. Analysis of family foci has shown that for children the most frequent source of infection is the mother, for women - the husband, or boyfriends, for males - the wife or girfriend. The frequency of the disease in cohabiting couples indicates a possible sexual path of transmission. Most male homosexuals in one study were infected. Perinatal infection is also an important path of natural transmission. In general the frequency of carrying the Autstralia antigen and level of morbidity of viral hepatitis in various regions are apparently determined by a variety of factors, important among which are natural geographic, social-economic and genetic factors. References 73: 14 Russian, 59 Western.
[1524-6508]

UDC: 615.371:579.841.93].015.46.036.8

COMPARATIVE STUDY OF HARMLESSNESS, REACTOGENICITY AND ANTIGEN ACTIVITY OF BRUCELLOSIS CHEMICAL AND LIVE VACCINES IN CONTROLLED EPIDEMIOLOGIC EXPERIMENT

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 84 (manuscript received 21 Apr 83) pp 58-63

SUMAROKOV, A. A., KARINSKAYA, G. A., DRANOVSKAYA, Ye. A., VERSHILOVA, P. A., SHARIPOV, M. K., DZHALILOV, K. D., MIRZAYEVA, M. A., GADEL'SHIN, I. A., MALIKOV, V. Ye., GRINBERG, I. S., IKOYEV, V. N. and KHARAZYAN, N. G., State Scientific Research Institute of Standardization and Testing of Medical Biological Preparations imeni L. A. Tarasevich; Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] The presence and degree of reaction, allergy and antigen activity of a selected dose of a new vaccine were tested under conditions of first vaccination. Two experimental series of brucellosis chemical vaccine were tested. Persons over 18 years of age with negative serologic and allergic reaction, who were intended to receive brucellosis vaccination, were involved in the study. The brucellosis chemical vaccine and placebo were administered

one time i/m in the upper third of the shoulder. It was found that the chemical vaccine produces little reaction: mild overall reaction, weak and moderate local reaction, not exceeding 48 to 72 hours in duration. The antigen activity of the vaccine over a period of 4 months was equal to that of the live brucellosis vaccine. The geometric mean antibody titers did not differ significantly for one year after immunization. The sensitizing activity of the chemical vaccine was 12.5 times less than that of the live vaccine after 4 months, 2.5 times less after 12 months. Figures 3; references: 10 Russian.
[1524-6508]

UDC: 616.98:579.843.95]-022.39:598.2-113.28(474.5)

RESULTS OF STUDY OF AVIAN EXCREMENT COLLECTED IN LITHUANIAN SSR TO STUDY TULAREMIA EPIZOOTICS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 84 (manuscript received 23 Mar 83) pp 67-71

MOTEYUNAS, L. I., MESHCHERYAKOVA, I. S. and DEMIDOVA, T. N., Vil'nyus University Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] The method of studying avian excrement as used to determine the activity of tularemia foci in Lithuania at the present time. The excrement was collected between 1974 and 1982 in August each year as a part of combined scientific expeditions. Excrement was collected selectively in various administrative regions to cover all of the ecologic-faunistic regions. Only excrement containing undigested food residue of animal origin such as bones and fur of small mammals was collected. It was established that in the northwestern and southwestern ecologic-faunisitc region the greatest number of excrement samples with tularemia microbe antigen was collected. The central and southeastern ecologic-faunistic regions of the Lithuanian Republic were also practically equal, though the difference was statistically significant between these areas and the first two. Regions boundering Kaliningrad Oblast are most unfavorable with respect to tularemia. A direct correlation was found bteween the results of the studies of bird excrement and an allergy investigation of the population. Figures 1; references 8: 6 Russian, 2 Western.
[1524-6508]

UDC: 616.98:579.843.95]-07:616.155.33-008.13

PHAGOCYTOSIS OF TULAREMIA MICROBE BY MACROPHAGES OBTAINED FROM ANIMALS WITH VARIOUS DEGREES OF CONGENITAL TULAREMIA RESISTANCE

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 84 (manuscript received 27 Jun 83) pp 108-109

VASIL'YEVA, G. I., KISELEVA, A. K., POTKOVA, L. V. and PUSTOVALOV, V. L.,
Antiplague Research Institute, Rostov-na-Donu

[Abstract] The purpose of this work was determination of a connection between phagocytic activity of microphages and congenital resistance of animals to tularemia and development of the most convenient experimental model to study the factors influencing the phagocytosis of the tularemia microbe. Studies were performed on peritoneal macrophages from highly sensitive white mice, white rats of little sensitivity and macrophages from guinea pigs which occupy an intermediate position. The macrophages were cultivated on covered glasses in penicillin flasks with medium No. 199 containing 20% inoculated human blood serum. The cultures of tularemia microbe were added to the macrophages so that the ratio of the number of phagocytes to the number of microbes was 1:10. The results of the studies showed that the absorptive activity with respect to these cultures was higher for macrophages obtained from rats than from guinea pigs or white mice. According to the data developed in this study, peritoneal macrophages of rats capture and digest tularemia microbes much better than the macrophages of white mice and have resistance to the cytopathic effect of this microorganism. The macrophages of guinea pigs occupy an intermediate position. The results showed that the most convenient model for the study of factors influencing phagocytosis of the tularemia microbe is the following system: peritoneal macrophages of white rats - vaccine strain of F tularensis 1:10.
[1524-6508]

BRIEF

NEW INSTITUTE OF ECOLOGICAL GENETICS--A decision was made to organize the Institute of Ecological Genetics in the system of the Moldavian Academy of Sciences. This will be the 16th scientific department in the system of the republic's Academy of Sciences, and the first institute with this specialty in our country. This is what A. Zhuchenko, president of the Moldavian Academy of Sciences, corresponding member of the USSR Academy of Sciences, had to say in commenting on this news: "Organization of the Institute of Ecological Genetics opens up wide horizons for further work on problems of adaptive strategy for intensification of agricultural production. Our task is to learn to use all biological components more efficiently. For this, integrated and systemic studies will be required of living organisms on the molecular, subcellular, cellular and other levels. One of the main problems that will be solved in this regard by the scientific associates of the new institute is the genetic nature of adaptive reactions of higher organisms. On this basis, new methods will have to be developed for breeding, controlling adaptive reactions and designing fluocenoses [?]. All this is of enormous significance to problems of stability of agricultural production, energy efficiency and other aspects. The new institute will have the most modern material and technical base. I am referring to a biotron, which this newspaper recently discussed, an excellent building the construction of which will be completed this year." [Text] [Kishinev SOVETSKAYA MOLDAVIA in Russian 13 Jul 84 p 4] 10,657

ENGINEERED GENES

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 15 Sep 84 p 4

ZAGAL'SKIY, L. and KOZYREV, S., interviewers for PRAVDA

[Abstract] This article reports an interview of Ye. Ginter, Laboratory of the Institute of Medical Genetics, USSR Academy of Medical Sciences, Moscow. The interview was conducted during the 14th annual conference of the European Society on Environmental Mutagens. Ginter discussed the connection between biology and medicine found in the science of genetics, wherein he noted the special nature of genetic problems and their solutions, as families seek counseling rather than treatment. Heredity and environmental causes of genetic problems are cited. New chemical treatments for genetic problems caused by the environment were stressed at the conference of 350 scientists, held at "Sovintcenter". The interviewee stressed that city and rural dwellers are subject to the same external genetic influences. Practical measures, such as use of iodized salt, are noted to prevent environmentally-caused ailments.
[862-12131]

UDC 575.222.75:576.316.24

PHENOMENON OF DELAYED DISRUPTION OF TELOMERIC LINKS BETWEEN CHROMOSOMES IN POLYKARYOCYTES FROM HYBRID CELLS OF HUMANS AND CHINESE HAMSTERS

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian No 7, Jul 84 (manuscript received 15 Aug 83) pp 87-88

STOBETSKIY, V. I., GRACHEV, V. P. and MIRONOVA, L. L., Laboratory of Tissue Cultures, Institute of Poliomyelitis and Viral Encephalites, USSR Academy of Medical Sciences, Moscow

[Abstract] The phenomenon of delayed disruption of telomeric chromosome bonds has shown that the metaphases of multi-nuclear cells induced by colcemide and 5-bromodeoxyuridine revealed chromosomes with two and more centromers. The present article reports on the phenomenon in hybrid human-chinese hamster somatic cells. Two clones of hybrid cells were used in the experiments. Results showed that nearly half of the metaphases contained chromosomes with two or more centromers. Results corresponded to those obtained

with 237S clones of the B11d-11-FAF28 line. The MOM-8-1 and MOM-8-3 hybrid cells were thus the second subject where retardation of disruption of telomeric chromosome bonds has been demonstrated. Figures 2; references: 1 Western. [848-12131]

UDC: 613.644

PROBLEM OF STANDARDIZING COMBINED EFFECT OF LOCAL VIBRATION AND NOISE

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 3, Mar 84 (manuscript received 22 Aug 83) pp 1-4

BYSHCHIPAN, V. F., BAZOVKIN, P. S., Institute of Labor Hygiene and Occupational Diseases, Krivoy Rog.

[Abstract] A study was made of the combined effect of local vibration and noise in which situations were empirically selected under which the vibration and noise represent no unfavorable effect on the body. The dynamics of vibration sensitivity are mathematically represented and the two factors are added together. It was found that after one hour's exposure the threshold of auditory sensitivity was raised by 8 to 13 dB in the 125 to 4000 Hz range. Permissible combinations of maximum local vibration and noise spectra are derived. The experimental data confirmed the correctness of the additive model within the limits of vibration and noise tested. References: 10 Russian. [1608-6508]

CLINICAL-IMMUNOLOGIC PARALLELS IN DYNAMICS OF DEVELOPMENT OF CUTANEOUS LEISHMANIASIS

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 10, Oct 83, pp 3-7

DOBRZHANSKAYA, R. S., Turkmenian Scientific Research Institute of Skin Diseases (Director - Candidate of Medical Sciences K. A. Khalnazarov)

[Abstract] The purpose of this study was to solve the problem of formation of specific antibodies in cutaneous leishmaniasis (CL), establish the regularities of their development and their interrelationship with clinical manifestations of the disease. Some 507 persons were under observation, 317 with zoonosic, 58 with anthroponosic CL, 26 who had a specific process in the past, 106 in a control group. Animal experiments were also performed, for a total of over 20,000 serologic reactions. A special series of experiments on immunized rabbits and experimentally infected mice was undertaken to confirm the specificity of antibodies and select the best method of sero-immunologic investigation. Seven independent varieties of leishmaniasis antibodies were found. It was found that there are special clinical varieties of CL with secondary foci of infection up to 100 cm from the point of entry of the pathogen into the body, resulting from migration of parasites through intercellular skin channels. There is a clear parallel between accumulation of antibodies and the clinical course of the disease. The serologic and pathomorphologic parallels indicate the possibility of combined CL immunity resulting from both cellular and humoral defense factors. Determination of specific antibodies can be used to find CL or its traces and determine the intensity of the immunity. References 15: 9 Russian, 6 Western.
[1609-6508]

UDC: 616.9-07:615.155.33-008.13

MACROPHAGES IN NONSPECIFIC INTERACTION WITH INFECTIOUS AGENTS

Moscow IMMUNOLOGIYA in Russian No 3, May-Jun 84
(manuscript received 28 Dec 82) pp 10-16

VOSKRESENSKIY, A. M. and ARKAD'YEVA, G. Ye., First Leningrad Medical Institute imeni I. P. Pavlov

[Abstract] This is a review article. Earlier authors have suggested the term "system of mononuclear phagocytes (SMP)," combining cells which are considered to a single cell line. The Reticuloendothelial Society Committee on Nomenclature of Macrophages has recommended the following terms for representation of microphages depending on their activity: resident, induced and activated. These terms are defined. An immunologic agent activates microphages through specific receptors and other cell surface structures. Among nonimmunologic agents activating phagocytes are apparently exogenous and endogenous products and structures formed upon breakdown of cells and tissues of the organism as a result of infectious or other processes. Among the many substances capable of causing intracellular protective processes are substances labilizing lysosomal membranes such as microorganism endotoxins, vitamin A and others. It is probable that a functional classification of SMP cells can be supplemented by the term "inactivated" or "block" macrophages. The interaction of macrophages with microorganisms is discussed. Modern concepts of nonspecific interaction of macrophages with infectious agents are in full agreement with the phagocytic theory developed 100 years ago. Genetically determined resistance to phytopathogenic and other viruses is manifested in the breakdown of captured particles by resident macrophages. Intracellular parasites multiply in resident macrophages, suppressing the phagosomo-lysosomal apparatus of the cell. The intracellular existence of these microbes is probably a special version of parasitism, for which the phagocytes have not yet been prepared by evolution. Figures 1; references 95: 40 Russian, 55 Western.
[1606-6508]

UDC: 612.017.1-06:612.273.2

CELLULAR MECHANISMS OF INFLUENCE OF ACUTE HYPOXIA ON ANTIBODY FORMATION

Moscow IMMUNOLOGIYA in Russian No 3, May-Jun 84
(manuscript received 22 Jun 82) pp 75-77

KOZLOV, V. A., TSYRLOVA, I. G. and CHEGLYAKOVA, V. V., Institute of Clinical Immunology, Siberian Department, USSR Academy of Medical Sciences, Novosibirsk

[Abstract] A study is reported of the influence of spleen cells, taken from mice with erythropoiesis stimulated after acute hypoxia, on the inductive

and productive phases of antibody formation. Acute hypoxia was created by holding the mice in a pressure chamber for 12 hours at 0.42 atm. Mouse spleen cells were transfered on the 3rd and 7th days after hypoxia to syngenous recipients immunized with sheep erythrocytes in the inductive and productive phases of antibody formation. An immunodepressive effect of introduction of $50 \cdot 10^6$ speen cells obtained on the 3rd and 7th days after creation of acute hypoxia was observed. Suppression of antibody formation occurs upon administration of spleen cells both in the inductive and productive phases. The effect of antibody formation suppression in the inductive phase is unrelated to the presence of mature erythrocytes in the suspension introduced, whereas in the productive phase, changes in the quantitative and qualitative composition of erythroid cells is apparently important. Figures 2; references 11: 7 Russian, 4 Western.
[1606-6508]

UDC: 579.881.11.083.331

REACTION OF COAGGLUTINATION WITH SOLUBLE RICKETSIA ANTIGEN

Moscow IMMUNOLOGIYA in Russian No 3, May-Jun 84 (manuscript received 30 Aug 82) pp 86-87

RAYKHER, L. I., KHAZINA, Ye. Kh., SPERANSKAYA, V. N., GROMAKOVSKAYA, Ye. T., SMUROVA, L. Yu. and TUPITSYN, A. V., Perm' Scientific Research Institute of Vaccines and Sera

[Abstract] An attempt was made to estimate the possibility of reproducing the coagglutination reaction with soluble Ricketsia antigens. Sera were treated with a suspension of staphylococcus. To 1 ml of 10% staphylococcus suspension was added 0.1 ml of whole or dilute serum. After 1 hour incubation at 20-22°C with constant agitation, microbe cells with antigens placed on them were precipitated by centrifugation at 3000 rpm for 30 minutes and the sediment resuspended in a buffered saline solution (pH 7.4) with 0.1% fox serum albumin. The reaction was performed on glass. It was shown to be possible to fix antibodies to Ricketsia on staphylococcus containing protein A. The specific staphylococcus reagent allow determination and differentiation of soluble Ricketsia antigens of the corresponding species in the coagglutination reaction. References 14: 8 Russian, 6 Western.
[1606-6508]

UDC: 576.809.8:582.281.2

WATER SOLUBLE COMPLEX OF LIVING COCCIDIOIDES IMMITIS RIXFORD ET GILCHRIST CELLS AND ITS USE IN IMMUNOLOGIC STUDIES

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 18, No 3, May-Jun 84 (manuscript received 19 Apr 82) pp 225-230

LESOVOY, V. S., PROKOF'YEVA, Ye. I., ROGOZHKINA, N. M., LIPNITSKIY, A. V. and KHRAPOVA, N. P., Volgograd Scientific Research Anti-Plague Institute

[Abstract] A study is made of the range of possibilities for the use of antigens obtained by precipitation with acetone in immunologic studies. The highly virulent strain 36-S of the fungus coccidioides immitis Rixford et Gilchrist was studied in the micelial phase of growth. It was used to infect animals, reduce a corpuscular antigen and soluble complex as well as for immunization of experimental animals. The data show that the complex can be used for testing of both cellular and humoral immunity. The serum produced against it is highly specific with respect to a homologous antigen. It is recommended for various immunologic reactions, particularly in laboratories which do not have a set of specialized antigens available. References 15: 6 Russian, 9 Western.
[1586-6508]

UDC: 616-018.7-022.7:579.842.11]-07

STUDY OF NATURE OF INTERACTION OF ENTEROPATHOGENIC ESCHERICHIA COLI WITH SUPERFICIAL STRUCTURES OF EPITHELIAL CELLS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 4, Apr 84 (manuscript received 14 Sep 83) pp 40-42

UVAROVA, V. I. and SHURGAYA, M. A., Institute of Experimental Pathology and Therapy, USSR Academy of Medical Sciences, Sukhumi

[Abstract] The nature of interaction of enteropathogenic E. coli isolated from diseased apes with the surface structures of epithelial cells was studied at the ultrastructural level, using two strains of enteropathogenic E. coli isolated from apes in an area of clinical dysentery. Both strains caused both kerato-conjunctivitis in a bioassay in guinea pigs. The strains were cultivated for 18 hours, 37°C, in meat-peptone broth, bacteria precipitate by centrifugation, washed with saline and used to inoculate epithelial cells. Scanning electron microscope studies revealed the nature of changes in topography of the cell surface at various times after Chinese hamster ovary cells were inoculated with pathogenic E. coli. It was found that the process of adhesion of the strains to the surface of the epithelial cells in the system in vitro has two phases. In the second phase it is characteristic that specific ruptures appear on the cell surfaces. References 8: 2 Russian, 6 Western.
[1528-6508]

UDC: 615.371:579.843.95].03

EFFECTIVENESS OF REVACCINATION OF HAMADRYAS BABOONS WITH NIIS LIVE DRY PLAGUE VACCINE AND PLAGUE MICROBE FRACTION 1

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 4, Apr 84 (manuscript received 27 Oct 83) pp 74-76

BYVALOV, A. A., PAUTOV, V. N., CHICHERIN, Yu. V., LEBEDINSKIY, V. A., YEVTIGNEYEV, V. I., TIKHONOV, I. V., DODONOV, N. P., KEDROV, O. A. (deceased), and BUGAYEV, Yu. V.

[Abstract] A comparative study is presented of the effectiveness of live NIIS vaccine administered by needleless and inhalation methods of revaccination as well as fraction I and its combination with Yersinia pestis lipopolysaccharide (LPS) for revaccination of hamadryas baboons. NIIS dry live plague vaccine prepared from strain EB fraction I obtained from a deep culture of vaccine strain EB isolated by the Davies method were used as the vaccine preparations. Experimental animals received an ordinary aerosol NIIS vaccine at a dose of $15 \cdot 10^6$ living microbes (mass of experimental animals 3-8 kg). After 6 months, one group of animals was revaccinated subcutaneously at $320 \cdot 10^6$ microbes, another received the NIIS vaccine by inhalation at $15 \cdot 10^6$ microbes, a third received fraction I subcutaneously at 2 mg dose in aluminum hydroxide gel, a fourth received a combination of fraction I at 2 mg and LPS (1 mg). Subcutaneous revaccination with NIIS vaccine forms greater immunity to aerosol infection with plague pathogen than inhalation revaccination. Vaccination by adsorbed fraction I of the plague microbe 2 mg achieves equal results. LPS of Y. pestis at a dose of 1 mg in combination with fraction I achieves no adjuvant effect.
References 9: 5 Russian, 4 Western.
[1528-6508]

UDC: 615.371:578.824.11].03

ESTIMATE OF EFFECTIVENESS OF ANTIRABIES SERUM PURIFIED AND CONCENTRATED BY "PROSDIS-4" METHOD

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 4, Apr 84 (manuscript received 27 Jun 83) pp 77-79

RAKHIMOVA, F. I., SENSYZBAYEV, B. K., SINYASHIN, N. I., SHAKHMATOVA, Ye. M., FEDORCHUK, V. P. and IVANOVA, L. I., Tashkent Scientific Research Institute of Vaccines and Sera, USSR Health Ministry

[Abstract] A test was performed of the antirabies serum isolated and concentrated by the "Prosdis-4" method in a limited epidemiologic experiment. The purpose of the test was to study the therapeutic-prophylactic effectiveness of the preparation for persons bitten by rabid or possibly rabid animals, to determine the dynamics of immunogenesis in tests of the specific antibodies

and to study the reaction to preparations. 124 persons were involved in the study. Patients received from 5 to 40 ml depending on location of bite, nature of injury and age. The antirabies serum was found to have clear therapeutic and prophylactic effectiveness and to cause less severe reactions than antirabies gamma globulin. Patients were observed for 2 weeks for side effects and of the 124 patients, 6 had reddening in the area where the preparation was administered, three were feverish on the 7th day.
References: 6 Russian.
[1528-6508]

UDC: 616.98:579.843.93/-078.73

DETERMINATION OF TULAREMIA ANTIBODIES BY IMMUNOENZYME METHOD ON SOLID PHASE CARRIER (ELISA)

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 4, Apr 84 (manuscript received 8 Jun 83) pp 79-83

UMNOVA, N. S., SHAKHANINA, K. L., MESHCHERYAKOVA, I. S. and PAVLOVA, I. P.,
Scientific Research Institute of Epidemiology and Microbiology
imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] This study was intended to develop and evaluate a quantitative method of determining tularemia antibodies by means of the ELISA method and compare it with other serologic methods. 28 sera from persons vaccinated against tularemia were used in the study. Sera were collected from a few months to 3-5 years after vaccination. 6 sera from unvaccinated persons were studied as controls. Comparative analysis of specific tularemia antibodies in sera of vaccinated and unvaccinated persons performed by the ELISA method showed that although the titers of vaccinated persons vary quite broadly (from 1:800 to 1:12,800) they were in all cases reliably different from those of nonvaccinated persons. Optimal conditions for quantitative determination of tularemia antibodies in the blood serum of vaccinated and unvaccinated persons by the ELISA method were developed. The method is shown to be highly sensitive for determination of tularemia antibodies, 20 to 40 times more sensitive than previous methods and 4 times more sensitive than the DASS method. References 15: 9 Russian, 6 Western.
[1528-6508]

UDC: 615.371:[579.843.1+579.842.14].032.77

REACTIVITY AND IMMUNOLOGIC EFFECTIVENESS OF CHEMICALLY ADSORBED TYPHUS ABDOMINALIS VACCINE IN ASSOCIATION WITH CHOLEROGEN-ANATOXIN UPON SUBCUTANEOUS ADMINISTRATION BY JET INJECTOR

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 84 (manuscript received 15 Feb 83) pp 95-97

GAPOCHKO, K. F., YEMEL'YANOVA, O. V., KONOVALOV, S. I., MOKROUSOV, V. B. and TITOVA, T. S., Military Medical Academy imeni S. M. Kirov, Leningrad

[Abstract] Clinical-immunologic data are presented, demonstrating the possibility of using the association of vaccines mentioned in the title for subcutaneous immunization of humans with a jet injector. Vaccines used included chemically adsorbed typhus abdominalis vaccine series 82/8, KN3415 and cholerogenanatoxin series 2/3, KN450, both with expiration date June 1980. A mixture was prepared of these two vaccines so that 1 ml contained one inoculation dose of each. 12 hours after inoculation the general post-vaccination reaction was recorded in all groups as weak or moderate. No significant difference was found between the needle and jet methods of inoculation in this respect. Infiltrates developed at the point of inoculation in practically all subjects, remaining for 5 to 7 days. The combination of vaccines caused a somewhat stronger local reaction, though the difference was statistically insignificant. No lost working time resulted from reaction to the inoculations. The method is recommended for broader application. References: 1 Russian.
[1524-6508]

UDC: 615.371:579.852.11].014.4

NINE YEAR STORAGE OF ANTITETANUS SERUM IN LIQUID NITROGEN

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 84 (manuscript received 9 Jun 83) pp 106-107

TSUTSAYEVA, A. A., MARKOVA, V. M., KHAYKIN, R. K., YURCHENKO, G. G. and RYNDIN, V. F., Institute of Problems of Cryobiology and Cryomedicine, Ukrainian SSR Academy of Sciences, Khar'kov

[Abstract] The purpose of this work was to study the specific properties of antitetanus serum stored for 9 years in liquid nitrogen beneath a protective polyethylene oxidate cryoprotector with a molecular weight of 400. The specific properties were studied after heating in a water bath to 41°C following 6 months, 1, 1 1/2, 2, 2 1/2, 3, 4, 7 and 9 years of storage. The antitoxin titer was determined in the reaction of neutralization of white mice, the acidity, pH, harmlessness, sterility and pyrogenic properties were all studied. Without the cryoprotector, antitetanus sera lost activity by an average of 20.9%, whereas with the protector they lost an average of 10%.

The drop in antitoxin titer of sera stored beneath the polyethylene oxide protector dropped 4.2% for sera with an initial titer over 2000 units, 3.3% for sera with an initial titer of less than 2000 units. All sera were apyrogenic. The sera from beneath the cryoprotectors were sterile and harmless. Sera stored in a refrigerator for 9 years at 4°C lost specific activity, regardless of initial titer.
[1524-6508]

UDC: 616.927-05:515.995.121.21]-092:612.017.1

STUDY OF CELLULAR IMMUNITY FACTORS IN TYPHUS ABDOMINALIS PATIENTS AND BACTERIA CARRIERS WITH ACCOMPANYING OPISTHORCHIASIS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 84 (manuscript received 6 May 83) pp 107-108

OBGOL'TS, A. A., DALMATOV, D. M., DOLGIKH, T. I., ZAYKOVA, E. F., TELEVNAYA, L. G. and RAYKHERT, N. F., Omsk Medical Institute imeni M. I. Kalinin

[Abstract] The reaction of inhibition of migration of leucocytes was used to study certain regularities in the development of cellular immunity in typhus abdominalis infections associated with opisthorchiasis. 63 patients with typhus abdominalis, paratyphus A and B, 48 acute and chronic carriers were studied, among whom were 10 and 20 persons with accompanying opisthorchiasis invasion. Control groups consisted of 31 opisthorchiasis patients, 48 non-specific infectious and somatic disease patients and 36 healthy donors. It was shown that acute typhus abdominalis infection is accompanied by the formation of cellular immunity, the manifestation and level of which depend upon the intensity of antigen stimulus, depth of development of the infectious process and presence of accompanying disease. The dynamics of development of cellular moderated immunity in typhus abdominalis are unstable with a tendency to shift in the negative direction with unfavorable course of the disease. Among carriers, cell-modulated immunity is most clearly expressed and stable. Opisthorchiasis invasion does not have a significant influence on mechanisms of formation of antibacterial cellular immunity among typhus abdominalis patients and bacteria carriers.
[1524-6508]

OPTICAL FIBERS FOR LASER SURGERY

Moscow PRAVDA in Russian 6 Sep 84 p 3

[Text] Work on development of optical fibers for laser surgery is being done at the initiative and under the leadership of Academician G. G. Devyatykh at the USSR Academy of Sciences' Institute of Chemistry. (A photograph shows Devyatykh working with Candidate of Chemical Sciences I. Skripachev, an associate of the chemistry institute, and A. Vasil'yev, an engineer of the academy's Institute of General Physics.)

FTD/SNAP
CSO: 1840/010

CARBON DIOXIDE LASER IN TREATMENT OF ACUTE PARAPROCTITIS AND PARARECTAL FISTULAS

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 12, Dec 83 pp 38, 39

BABAYEV, O. G., BABAYEV, Kh. B. and KADAMOV, G. K.

[Abstract] Experience in the use of a carbon dioxide laser in the treatment of more than 200 patients with acute and chronic paraproctitis is generalized. Surgical procedures for the dissection and steaming of purulent cavities in the case of acute paraproctitis are explained, as well as laser beam dissection of intra- and transsphincter pararectal fistulas. A good deal of attention is given to preoperative preparation of patients, surgical procedures, and their treatment during the postoperative period. Use of a laser scalpel in the treatment of paraproctitis reduces the number of post-operative complications and shortens the length of hospital and outpatient treatment.
[1612-12262]

LASER SURGERY FOR TREATMENT OF SEVERE BURNS

Moscow VECHERNAYA MOSKVA 16 Aug 84 p 2

SAMOYLOV, B.

[Abstract] The article provides information on laser methods which specialists of the All-Union Center for the Employment of Lasers in Surgery have developed for treatment of severe burns. Professor Ye. I. Brekhov, deputy director of this center and a USSR State Prize laureate, gave an account of the development of a laser method which is being used for the removal of dead skin tissues soon after the injury, and he mentioned some of this method's advantages. Work on the method began at the All-Union center. Specialists of the burn injuries department of the Scientific Research Institute of First Aid imeni Sklifosovskiy took part in the introduction of the method. This department is headed by Candidate of Medical Sciences Larisa Ivanovna Gerasimova. More than 500 oeprations reportedly have been performed with the laser.

FTD/SNAP
CSO: 1840/1596

MEDICINE

DIAGNOSTIC METHOD MEASURES SKIN'S HEAT EMISSION

Kiev RABOCHAYA GAZETA 22 Aug 84 p 4

[Text] Riga--As he placed electrodes first on one part of the patient's body and then on another, the physician kept his eye on the scale of an instrument which measures the electrical conductance of the skin. After completing the examination, the physician stated:

"The liver must be checked; everything else is normal."

This auxiliary method of diagnosis which neurophysiologists of the Latvian Scientific Research Institute of Experimental and Clinical Medicine have developed takes features of the skin's thermoregulation into account.

"Different parts of the skin react differently to heightened air temperature, and this can be judged on the basis of changes in their electrical conductance," explained Candidate of Medical Sciences A. Aldersons. "We are interested not just in any part, however, but only in the so-called reflexogenic zones, each of which reflects the condition of a certain organ. If its functions are impaired, heat emission increases in a certain place on the body's surface. And, conversely, a decrease in heat emission is a desired sign that all is well.

"Associates of the institute have drawn up a diagram showing the location of these zones. Individual zones have areas as large as 15 square centimeters. One has a direct neural bond with the heart, another with the lungs, a third with the kidneys. There are about 30 such zones in all.

"This innovation supplements but does not replace conventional forms of diagnosis," the scientist remarked. "By detecting danger signals of the organism, we are helping our colleagues find the causes of functional disorders. Moreover, it is very important to know what kind of effect is being produced by a course of treatment. It is precisely here that our information proves to be particularly valuable; as an illness disappears, the skin's thermoregulation becomes normal in the corresponding zone."

TASS correspondent S. Shpungin reports that the Latvian medical specialists have amassed extensive material in the course of their investigations. Using the new method, more than a thousand patients have been examined.

FTD/SNAP
CSO: 1840/1596

HEMATOLOGY INSTITUTE FREEZE-DRIES BLOOD PLASMA

Yerevan KOMMUNIST in Russian 5 Sep 84 p 4

[Article by G. Amatuni]

[Text] The Scientific Research Institute of Hematology and Blood Transfusion of the Armenian SSR Ministry of Health has been able to preserve blood plasma for more than five years through the use of a freeze-drying unit.

By a reliable and stable method of processing donor blood, dry plasma which can be stored at room temperature is being produced in the institute's experimental technology department. The unit's capacity is 45 liters of blood per day.

The new method, which is being used in our republic for the first time, completely eliminates losses of donor blood.

FTD/SNAP
CSO: 1840/864

COMPUTERIZED THERAPY OF CIRCULATORY DISORDER

Moscow MEDITSINSKAYA GAZETA in Russian 12 Sep 84 p 3

[Abstract] The author comments on research by a group of Soviet scientists whose results are presented in a work entitled "A New Approach to the Diagnosis and Treatment of Acute Circulatory Disturbances, Using Mathematical Models and Methods, and Introduction of This Approach into Practice". The USSR Academy of Medical Sciences' Institute of Cardiovascular Surgery imeni Bakulev has nominated this work for the 1984 USSR State Prize. The work is said to be the leading one of its kind in both Soviet and world medical science. The work's authors are credited in particular with developing a clinical-mathematical approach to evaluating the condition of patients, on the basis of mathematical models of the circulatory and external respiratory systems. This method was realized in the form of a computerized system whose functions include the monitoring of patients.

FTD/SNAP
CSO: 1840/010

DISCOVERY OF AORTIC-VALVE MECHANISM LEADS TO BETTER PROSTHESIS

Moscow TRUD 10 Aug 84 p 4

POMINOV, A.

[Abstract] The article provides background on a discovery which has been registered in the field of cardiology. It was made by scientists and engineers of the All-Union Surgery Research Center of the USSR Academy of Medical Sciences, and the Moscow Higher Technical School imeni Bauman (MVTU).

A conversation with Candidate of Medical Sciences Sergey Leonidovich Dzemeshkevich, senior science associate of the surgery research center and one of the authors of the discovery, is recorded. The discovery is said to be a result of studies of the operating mechanism of the aortic valve which Dzemeshkevich and his colleagues conducted with the aim of designing optimal biological prostheses for the replacement of damaged valves. Dzemeshkevich related that Doctor of Technical Sciences V. Sagelevich and Candidate of Technical Sciences N. Zavalishin of MVTU were enlisted in this project when an unusual structure of the root of the aorta and the aortic valve was discovered. Further investigations revealed, in particular, that the cusps of the aortic valve are set in motion by changes in the effort and movements of the elastic framework of the aorta's root, which is connected with these cusps. An investigation of the possibility of artificially reconstructing this framework was begun as a result of the discovery.

This research reportedly made possible the development of a new type of biological prosthesis which is free of danger of blood clots or other anomalies. An artificial aortic valve of this type which was implanted in a patient six years ago by Professor Boris Alekseyevich Konstantinov, another of the discovery's authors, is still performing excellently, according to Dzemeshkevich.

FTD/SNAP
CSO: 1840/1596

LOW TEMPERATURE AS THERAPEUTIC TECHNIQUE

Moscow MEDITSINSKAYA GAZETA in Russian 24 Aug 84 p 3

KHITROV, F., Lenin Prize Laureate, Professor

[Abstract] The theoretical and practical principles of application of cold to oncology have now been developed by scientists at the All-Union Oncologic Scientific Center, USSR Academy of Medical Sciences, the All-Union Scientific and Testing Institute of Medical Technology, USSR Ministry of Health and a number of industrial enterprises. Automatic program-controlled cryogenic apparatus has been developed to create high stability of cold effects. It has been shown that the macroscopic and microscopic characteristics of freezing and cryonecrosis depend essentially on the temperature, time and speed of cooling, as well as parameters of instruments and the technology of cold applications. Multifunctional installations with automatic control have been developed (KPRK-01, KPRK-02), as well as the universal installation for combined application (KAUM-01), small manual cryogenic apparatus (KA-02, KR-01). Joint studies by institutes in the USSR and Poland have developed the UK-20 device which has been shown highly effective in clinical testing and has been repeatedly exhibited at the Exhibition of Achievements of the USSR Economy and Medical Exhibition.
[1619-6508]

RESPIRATORY-SYNCYTIAL INFECTIONS IN YOUNG CHILDREN

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 10, Oct 83 pp 42-46

ALLANAZAROVA, O., PISKAREVA, N. A. and ANNAYEVA, O. M., Scientific Research Institute of Protection of the health of Mothers and Children (Director - Professor V. N. Bondarev), Turkmenian Ministry of Health

[Abstract] Studies performed over the past three years have shown that all viral agents important in the formation of acute respiratory disease and pneumonia elsewhere in the USSR are important in Turkmenia as well. A cycle of observation was performed on children hospitalized in Turkmenia to determine of the specifics and course of the disease are different there. Children from two months to seven years of age were included in the study. It was

found that children suffering from sporadic forms of respiratory-syncytial infections in most cases arrived in hospital in serious or critical condition. Only 7.4 cases of the disease passed without involvement of the lower respiratory tract. Bronchitis and bronchiolitis were diagnosed in 29.3% of cases, pneumonia in 58.2%. References: 3 Russian.
[1609-6508]

NEUROMUSCULAR DISEASES IN ASHKHABADSKAYA AND KRASNOVODSKAYA OBLASTS OF TURKMENIAN SSR

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 11, Nov 83 pp 3-7

MAMIEV, A. K., GABRIELYAN, S. S., SULTANOVA, L. S., NIKOLAYEVA, N. I., TURAYEVA, T. Sh. and NEPESOV, R., Turkmenian Scientific Research Institute of Neurology and Physical Therapy (Director - Candidate of Medical Sciences A. K. Mamiev), Turkmenian Order of Peoples Friendship State Medical Institute (Rector - Professor N. N. Nurmamedov)

[Abstract] Hereditary diseases are increasing as a fraction of the total of diseases. In modern medical literature, small families are considered a positive phenomenon preventing the spread of hereditary disease. There are several favorable factors for the appearance of hereditary pathologies in Turkmenia: the preservation of relative arbitrary isolates due to the tradition of marriage of people who are in the same tribe or live in the same area, and of the large numbers of children in Turkmenian families. The population of the republic grows by 60-70,000 per year (total population 3,000,000 in 1982). Proper organization of preventive medicine should decrease accumulation of hereditary pathology in the gene pool of the population regardless of population growth rate. Hereditary nervous system diseases have been studied in recent years throughout the USSR, allowing comparison of results. In Ashkhabadskaya Oblast, the hereditary nervous system disease rate was recently observed to be 21.6 per 100,000 population, as opposed to 17.2 per 100,000 in Saratov Oblast. The influence of marriage of related persons on high hereditary pathology morbidity has been demonstrated elsewhere. For Erbe-Rota myopathy, autosomal-recessive heredity has been found predominant. A case history is presented and studies performed have shown muscular dystrophy to be relatively common in the areas of the Turkmenian SSR under study. This confirms the importance of this direction of investigation, particularly since studies of families with intermarriage have shown a high percentage of family cases of the disease with infant mortality. References: 6 Russian.
[1610/6508]

UDC: 579.841.11.983.3

IMMUNOTYPING OF FRESHLY ISOLATED STRAINS OF PSEUDOMONAS AERUGINOSA

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 4, Apr 84 (manuscript received 13 Jul 83) pp 26-30

GRISHINA, I. A., KOLKER, I. I., SAMYKINA, T. D., KARAIVANOVA, Ye., SHILLER, B., KARBETSKI, M., SMANISLAVSKIY, Ye. S. and ZLATANOV, Z., Institute of Surgery, imeni A. V. Vishnevskiy, USSR Academy of Sciences, Moscow; Research Laboratory of Vaccines and Sera, Warsaw; Central Scientific Research Institute of Vaccines and Sera imeni I. I. Mechnikov, Moscow; Republic Scientific-Practical Institute of Emergency Medical Assistance imeni N. I. Pirogov, Sofia

[Abstract] The purposes of this study were: 1) study strains of P. aeruginosa isolated in three hospitals from patients with thermal burns; 2) provision of a basis for selection of cultures used for preparation of acellular vaccine - "pyoimmunogen"; 3) comparison of strains isolated from burn patients with strains isolated from the All-Union Center of Wounds and Wound Infections, Moscow; 4) determination of certain common and distinguishing features of populations characteristic for each hospital. Patients with wound trauma most frequently yielded strains of immunotypes 2, 3, 7, 3/7, hospital strains for burn hospitals. In preparing polyvalent immunologic preparations for the prophylaxis and treatment of infections in surgical patients, strains 2, 3 and 7 must be included. References 12: 6 Russian, 6 Western. [1528-6508]

MICROBIOLOGY

DETERMINATION OF SENSITIVITY OF NAG VIBRIOS TO ANTIBIOTICS BY THE METHOD OF DIFFUSION IN AGAR IN AGV MEDIUM

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 12, Dec 83 p 39

RAZVYKH, V. M., GINVENTAL', N. I., VED'MINA, Ye. A. and SVYATOV, V. I.

[Abstract] An analytical table for the semiquantitative (and quantitative) data interpretation of methods of diffusion in agar for determining the sensitivity of NAG vibrions to antibiotics is presented. It contains boundary values of growth retardation zone diameters in an AGV medium for three sensitivity categories and data on correlation of standard zone diameter values with MPK [expansion unknown] and regression equations.

12262
CSO: 1840/1612

UDC: 579.841.42.22

FORMATION OF EXOPOLYSACCHARIDES BY METHYLOTROPHIC MICROORGANISMS

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 3, May-Jun 84 (manuscript received 30 Mar 83) pp 22-26

GRINBERG, T. A., KOSENKO, L. V. and MALASHENKO, Yu. R., Institute of Microbiology and Virology, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] A study is made of the capability of methylotrophic microorganisms of various taxonomic positions to synthesize exopolysaccharides (EPS) during assimilation of methane or methanol under periodic and continuous cultivation conditions. It was found that the ability to synthesize EPS was characteristic of all methylotrops studied, obligate and facultative. The methane oxidizing bacteria Methylomonas rubra, Mm. methanica, Mm. gracilis, Methylomonas sp., Methylococcus thermophilus, Mc. luteus and Mc. ucrainicus synthesized 0.05-0.23 g EPS per g of biomass upon cultivation in liquid media in a batch process. The vibroid methane-oxidizing bacteria Methylosinus trichosporium, Ms. sporium, Methylocystis sp. and Mcs. parvus form trace quantities of EPS under the same conditions. The yeasts of the genem Torulopsis and Candida synthesize 0.10-0.16 g EPS per biomass upon assimilation of methanol. The methanol-assimilating bacteria of the genera Pseudomonas, Micrococcus and Bacillus synthesize even more EPS. The most active producers of polysaccharides are the methylotrops which utilize the hexulose-phosphate path of assimilation of C_1 compounds. Figures 1; references 13: 6 Russian, 7 Western. [805-6508]

UDC: 582.288-11

SYNCHRONOUS CULTIVATION OF METHANOL-ASSIMILATING YEASTS CANDIDA BOIDINII AND ANALYSIS OF PHYSIOLOGICAL HETEROGENEITY OF POPULATIONS

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 3, May-Jun 84 (manuscript received 12 May 83) pp 43-49

IVANOV, V. N. and SEDINA, S. A., Institute of Microbiology and Virology, Ukrainian Academy of Sciences, Kiev

[Abstract] Results are presented from the study of the process of synchronous reproduction of methanol-assimilating yeasts. The regularities found are used

for analysis of the physiological heterogeneity of the yeast population. The object of the study was a strain of methanol-assimilating Candida boidinii Ramirez 1953 distinguished by its high specific growth rate and economic coefficient. Periodic cultivation of the yeast shows nonuniform increases in biomass concentration and optical density of the suspension over time. It was found that the cell content of various morphologic phases changes regularly with time. The interval from 0 to 1.5 hours of cultivation, as well as 3.9 to 6.0 hours, can be considered a period of preparation for budding; from 1.0 to 2.3 hours, as well as 4.4 to 5.7 hours represent the period of early budding, the interval from 2.9 to 4.3 hours the period of late budding. Figures 8; references 10: 8 Russian, 2 Western.
[805-6508]

UDC: 582.28:621.892.09

MICELIAL FUNGI ISOLATED FROM TECHNICAL OILS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 18, No 3, May-Jun 84 (manuscript received 9 Nov 83) pp 205-208

SIZOVA, T. P., TOROPOVA, Ye. G., BELOUSOVA, A. A. and MATYUSHA, G. V., Moscow State University imeni M. V. Lomonosov

[Abstract] The purpose of this work was to determine the degree of fungus infestation of oils upon storage and use in various climatic regions, to determine the most active cultures capable of development in a specific sample of oil-fuel material. Sixty-six oil specimens of 19 types were used in the study, 56 taken from equipment in storage, 10 from equipment in use. Climatic regions included moderately warm, moderately cold, moderately warm with mild winter, temperate, very hot and dry, cold and tropical marine. Fungi were isolated from the specimens of oil by inoculation on solid nutrient media. Twenty-four different species of microscopic fungi were isolated, 22 of which were identified. The fungus resistance of 19 oils of various types was tested. Most resistant were types K-17, MS-20P, M-14GB and TAP-15V. Most active fungi were Aspergillus niger, Scopulariopsis brevicaulis, Phialophora fastigiata and Penicillium charlesii. References: 3 Russian.
[1586-6508]

UDC: 576.809.33:582.287.237

SELECTION AND CULTIVATION OF LIGNIN-DECOMPOSING FUNGI

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 18, No 3, May-Jun 84 (manuscript received 10 Feb 83) pp 210-215

AFANAS'EVA, M. M., Central Scientific Research Institute of Paper, Moscow Oblast

[Abstract] As a part of a continuing study, the author cultivated fungi on wood fiber, the substrate consisting of knotty birch. Wood cubes were placed in liquid fungus cultures or on well-established solid cultures for 10 to 60 days, then studied and weighed. It was found that the solid phase method of cultivating lignin-decomposing fungi on wood fiber was more promising for utilization of the lignin than the deep liquid method. Figures 2; references 12: 5 Russian, 7 Western.
[1586-6508]

UDC: 576.809.33:582.287.237

COMPARATIVE STUDY OF GROWTH OF SACCHAROMYCES AND HANSENULA YEASTS ON MEDIA CONTAINING ETHANOL

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 18, No 3, May-Jun 84 (manuscript received 21 Oct 83) pp 222-225

SHCHUROV, M. N. and NAUMOV, G. I., All-Union Scientific Research Institute of Genetics and Selection of Industrial Microorganisms, Moscow

[Abstract] A study is performed to compare the physiological and biochemical specific of ethanol-assimilating yeasts in the genera Saccharomyces and Hansenula. The capability of the yeast to assimilate ethanol, growth rate, prototrophicity and resistance to low medium pH and elevated cultivation temperature was studied. Some 67 yeast strains of the genus Saccharomyces and 57 strains of the genus Hansenula were studied. The yeasts were grown in minimal media. The ability of the yeast to assimilate ethanol, response to various pH values and ability to grow without addition of vitamins as studied in test tubes on a rocking device. It was found that 56 saccharomyces strains of 67 were capable of growing in a minimal medium with ethanol at pH 3.0. They required addition of vitamins for cultivation on media with ethanol, had low specific growth rate at 28°C and were generally nonpromising as protein producers. Among the Hansenula yeasts there were strins with a number of useful characteristics including high specific growth rate, resistance to low pH and elevated temperature; they could be recommended as protein producers on ethanol. References 7: 6 Russian, 1 Western.
[1586-6508]

UDC: 579.8.083.13

PREREQUISITES FOR COMPLETE EVALUATION OF PHYSIOLOGICAL STATUS OF BACTERIA AND THEIR POPULATIONS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 4, Apr 84 (manuscript received 8 Jun 83) pp 3-8

VAYSMAN, I. Sh., Perm' Scientific Research Institute of Vaccines and Sera

[Abstract] An attempt is made to discuss the multitude of reliable data now available from morphologic studies of the functioning of micropopulations as a basis for a number of important biotechnical processes. Serious difficulties are brought up by the lack of any officially approved nomenclature for anatomical formation and pathologic states of bacteria. The growth phases of bacterial populations are briefly discussed. Levels of metabolic processes during the pre-exponential and exponential growth phases are noted as important characteristics of bacterial populations. Aging of populations is seen as a natural stage of growth, consisting not only and not so much of exhaustion of nutrient media and accumulation of metabolic wastes. It is suggested that this natural diminution of growth is a result of population pressure. Biologically-active endogenous metabolites are excreted in cultures studied by the author when the population reaches a certain critically high level at the level of cell particle envelope structures, disrupting metabolic functions, suppressing autolytic processes, blocking division of bacteria. A correct estimate of the statis of bacteria can therefore be given only on the basis of a combined approach considering all available manifestations of vital activity, the nature of metabolism and morphology down to the ultrastructural level. References 40: 28 Russian, 12 Western.
[1528-6508]

UDC: 579.843.93:579.222

NONFERMENTING GRAM-NEGATIVE BACTERIA -BORDETELLA BRONCHISEPTICA

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 4, Apr 84 (manuscript received 16 May 83) pp 8-12

SHENDEROV, B. A. and SERKOVA, G. P., Saratov Medical Institute

[Abstract] B. bronchiseptica consists of small gram-negative coccus or rod-shaped bacteria found individually or in pairs. Thread-like forms measuring 0.4-8 μm have also been observed. The species forms no spores or capsules. In contrast to other members of the genus Bordetella it is mobile, but its mobility is frequently not observed upon cultivation for less than 3 days. A colony of B. bronchiseptica includes cells with no cell wall but with cell membrane and intact cytoplasm. The microorganisms have been observed to have different plasmids including a coating resistant to antibacterial preparations and capable of transmission upon conjugation. They are obligate aerobes,

chemoorganotropic. B. bronchiseptica produces an alkaline reaction on OF medium with glucose. Biochemically, they are similar to the CDC group IVc-2 of microorganisms. Antigen relationships among bacteria of the genus Bordetella have been studied by various methods. The antigen properties of Bordetella are subject to change and depend on the phase of growth in which the microorganism is studied, composition of the cultivation medium and number of passages. All species synthesize endotoxins of complex chemical structure and biological activity. There are reports that B. bronchiseptica, like B. pertussis, can produce histamine-sensitizing factor. B. bronchiseptica has variable susceptibility to chemotherapeutic preparations. Tetracyclin is the most active known antibiotic. Resistance to sulfanilamide, streptomycin and penicillin simultaneously is common. B. bronchiseptica is a portion of the normal flora of respiratory mucosa of animals and man and may cause pathologic processes under certain conditions. Clinical forms as well as asymptomatic carrying of the microorganisms have been reported in mass. In most cases the microorganisms are isolated from man in mixed culture primarily with opportunistic enterobacteria. Transmission of the infection from human to human has never been reported. References: 46 Western.
[1528-6508]

UDC 579.841.11.083.13

PRODUCTION OF EXOTOXIN A IN CULTIVATION OF PSEUDOMONAS AERUGINOSA PA-7 ON MARTEN'S BROTH

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 4, Apr 84 (manuscript received 8 Jun 83) pp 22-26

BRODINOVA, N. S., BASKAKOVA, N. V., MOROZ, A. F., VERTIYEV, Yu. V. and MOKRIYEVICH, N. M., Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Pseudomonas aeruginosa produces exotoxin A which is similar in its mechanism of action to diptheria toxin. Immune preparations neutralizing the effects of exotoxin A are therefore necessary for the treatment of P. aeruginosa infections. This article studies production of exotoxin A upon cultivation of P. aeruginosa on Marten's broth instead of on the usual tryptic soy broth. The cultivation of the strain PA-7 in Marten's broth did not yield high production of exotoxin A. When sodium glutamate and glycerin were added, production was 1.5 times higher than for strain PA-103. Cultivation conditions were developed for production of large volumes of toxic supernatant on Marten's broth containing 0.08 μg/ml Fe^{2+}, 0.05 M sodium glutimate and 1% glycerin 9 to 18 hours, pH 8.15-8.3. References 14: 1 Russian, 13 Western.
[1528-6508]

UDC: 579.844.1

NONFERMENTING GRAM-NEGATIVE BACTERIA--EIKENELLA CORRODENS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 84 (manuscript received 16 May 83) pp 3-7

SHENDEROV, B. A. and SERKOVA, G. P., Saratov Medical Institute

[Abstract] The first reports of isolation of gram-negative bacteria capable during growth of causing "corrosion" of an agar medium were published in 1948-1950. In early 1960 in the USA a collection of facultative aerobic gram-negative bacteria capable of corroding agar was independently made. Comparison of the European E. corrodens and the American HB-1 in 1973 demonstrated their identity. E. corrodens are small oval or rod-shaped gram-negative organisms. They can be grown under aerobic conditions if hemin is present at 5-25 μg per ml of medium, though stable versions not requiring the X-factor may develop in the process of subcultivation. To prevent oxidation and drying of clinical material intended for isolation of E. corrodens it is recommended that they be transported in a medium containing thioglycolate. Biochemically, E. corrodens is a weakly active organism. They are highly sensitive to antimicrobioal agents. These microorganisms differ clearly in antigen properties from such physiologically similar organisms as haemophylus, bacteroids, vibrio, brucella and moraxella. The pathogenicity for experimental animals is quite low. Simultaneous infection with E. corrodens and other microorganisms may be accompanied by the development of serious infectious damage, however, Strains of Eikenella capable of causing experimental endocarditis in rabbits were recently isolated from patients with periodontal abscess. E. corrodens is present in the normal flora of the oral cavity, upper respiratory tract and possibly the gastrointestinal and genitourinary tracts. However, it may cause such pathologic problems as meningitis, osteomyelitis, endocarditis, abscesses of the brain, liver, lungs, pancreas, jaw and various soft tissues, empyema, wound infections, sinusitic, diseases of the eye, ear, septicemia, septic arthritic and pneumonia. In most cases Eikenella are found in association with streptococcus, staphylococcus, pathogenic entobacteria, bacteroidus and haemophylus influenzae. References: 36 Western.
[1524-6508]

UDC: 579.88:579.24

INTERACTION OF RICKETTSIA AKARI WITH THE HOST CELL IN VITRO: REPRODUCTION, FORMATION OF SPHEROPLAST-LIKE FORMS AND DESTRUCTION IN PHAGOLYSOSOMES

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 84 (manuscript received 1 Feb 83) pp 23-26

POPOV, V. L. and BARKHOTOVA, O. I., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] A description is presented of the specifics of intracellular Rickettsial infection based on a model of R. akari, with particular attention given to processes of destruction and formation of altered forms. Four days after infection of transplanted fibroblast cells a monolayer in the test tubes was fixed for electron microscopy with 1% glutaraldehyde in a pH 7.2-7.4 buffer for 5-10 minutes, washed with buffer and refixed with 1% OsO_4 in the same buffer for 40 minutes. Four days after infection most cells in the monolayer contained significant quantities of Rickettsia. Intranuclear Rickettsia were not observed. In some cells accumulations of Rickettsia had a tendency to be located around the periphery of the host cell. In addition to reproducing Rickettsia the cytoplasm of the host cell contained spheroplast-like forms of Rickettsia. There were also Rickettsia within phagolysosome-type structures. The reproduction of R. akari has no structural pecularities in comparison to other Rickettsia. In addition to reproductive Rickettsia, the same cells regularly contain Rickettsia in the state of destruction within phagolysosomes. References 18: 7 Russian, 11 Western. [1524-6508]

UDC: 579.861.2:579.252.55

ROLE OF LYSOGENIZING PHAGES IN SPREAD OF PLASMIDS RESPONSIBLE FOR RESISTANCE TO DRUGS IN A STAPHYLOCOCCUS POPULATION

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 84 (manuscript received 12 Apr 83) pp 36-39

ZUYEVA, V. S., PASYNKOVA, L. N. and IL'INA, T. S., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Results are presented from a comparative study of the frequency of transmission of certain standard drug resistance plasmids by various phages of serologic group B from lysogen and nonlysogen plasmid-containing donors. The frequency of transmission of the plasmid rms 7, rms 5, pT127, pC194, pS194 and pUB101 by phages of serologic group B, lytically reproduced on plasmid-containing donors, is 10^{-6}-10^{-9} per phage particle. The frequency of transmission of the plasmids rms 7, rms 5 and pS194 by phagolysates obtained from plasmid-containing donors lysogenized for phage

52A is 10^{-2}-10^{-3}, plasmids pC194 and pUB101 - 10^{-7}. The transmission frequency of plasmid pT127 from a donor lysogenized for phage 53 is $5 \cdot 10^{-3}$. Phages 80, 85, F11 and S2 induced from plasmid-containing lysogen donors cannot perform transduction of the plasmid studied with high frequency.
References 20: 1 Russian, 19 Western.
[1524-6508]

UDC: 579.842.22/.23:579.26

ENZYMATIC MECHANISMS OF PSYCHROPHILICITY OF PSEUDOTUBERCULOSIS MICROBE

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 84 (manuscript received 20 Aug 82) pp 42-47

SAMOV, G. P. and VARVASHEVICH, T. N., Institute of Epidemiology and Microbiology, Siberian Department, USSR Academy of Medical Sciences, Vladivostok

[Abstract] A study was undertaken of a number of enzymatic mechanisms of the pseudotuberculosis microbe Yersinia pseudotuberculosis. In addition to the traditional study of properties of enzymes at 25-40°C, their activity was studied at relatively low temperatures. Models for the study included Yersinia pseudotuberculosis, Y. enterocolitica, Proteus vulgaris, based on the assumption that if these species of microbes are capable of multiplying at low temperatures, low temperature enzyme synthesis should exist. 22 strains of Y. pseudotuberculosis, 5 strains of Y. enterocolitica and 5 strains of Proteus vulgaris were used in the study. Cultures were grown on 1.5% nutrient agar, the same agar with 5% normal rabbit serum, cabbage juice and a synthetic mineral medium. The specific activity of urease, meuraminidase, hyaluronidase and nitrogenase was studied. It was found that the enzymes can function at 2-8°C as well as 37°C. The broad capability of thermal adaptation in the pseudotuberculosis microbe is provided by constant presence in the microbe cell of isoenzymes capable of functioning only at low or high temperatures. Low temperature in combination with the proper nutrient medium is a necessary factor for the activity of certain enzyme systems of the pseudotuberculosis microbe. Figures 3; references: 9 Russian.
[1524-6508]

UDC: 579.88.083.224.083.33

USE OF IMMUNORADIOMETRIC ANALYSIS TO DETERMINE RICKETTSIA ANTIGENS IN CELL CULTURES AND CHICK EMBRYOS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 84 (manuscript received 13 Apr 83) pp 79-82

PROZOROVSKIY, S. V., ALEKSEYEVA, N. V., KNYAZEVA, E. N., IGNATOVICH, V. F. and BARKHATOVA, O. I., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, Academy of Medical Sciences, Moscow

[Abstract] The purpose of this work was to study the possibility of using an indirect modification of the method of immunoradiometric analysis to determine Rickettsia antigens in various biological substrates and estimate the effectiveness of the method. The objects of the study were rickettsious diagnosticums, egg and cell cultures of Rickettsia. The method is found to be highly sensitive for determination of minimal quantities of antigens in these substrates. The data produced indicate the promise of using the method in various scientific studies related to detection of microorganisms and their antigens. References: 5 Russian.
[1524-6508]

UDC: 579.843.1:615,919].083.224

DETERMINATION OF CHOLERA ENTEROTOXIN IN SUPERNATANTS OF HOMOGENATES OF RABBIT SMALL INTESTINAL WALL IN PASSIVE IMMUNE HEMOLYSIS REACTIONS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 84 (manuscript received 21 Apr 83) pp 97-99

GAYLONSKAYA, I. N., ZHUKOVA, E. V., SVYATOY, V. I.,and SHAGINYAN, I. A., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] An attempt was made to establish the role of cholera enterotoxin in the enteropathogenic effect of slightly virulent strains on the model of rabbits and to determine the specificity of this model for this category of vibrios. The work involved 16 strains of V. eltor with various degrees of virulence, juvenile rabbits, supernatant from a homogenate from an intestinal mucosa, fluid accumulating in the lumen of the large intestines 8 to 12 hours after infection and cholera vibrio culture supernatants. The monospecific antitoxic serum was obtained from rabbits immunized with Schwarz/Mann toxin. The cholera toxin produced in vitro and in vivo was determined in the reaction of passive immune hemolysis. It was found that the rabbit model is specific only for strains producing enterotoxin. The slight virulence of the strains tested may also result from other biological products of their vital activity. Strains producing the toxin in vitro have a similar capability of synthesizing it in vivo. Strains capable of producing

the toxin only in vivo or in vitro were not found. The rabbit's intestinal wall mucosa receptors and sheep erythrocytes absorb the cholera enterotoxin with identical activity. The passive immune hemolysis reaction can be used for mass investigation as an objective method of determining the cholera virulence of vibrios. References 5: 1 Russian, 4 Western.
[1524-6508]

UDC 616.822.1:612.262]-06:615.849.112

EFFECT OF MICROWAVE RADIATION ON LOCAL BLOOD CIRCULATION AND OXYGENATION OF BRAIN TISSUE

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian No 7, Jul 84 (manuscript received 4 May 83) pp 37-39

MITAGVARIYA, N. P. and BICHER, Kh. I., Laboratory of Regulatory Mechanisms of Metabolic Protection of Brain Functions, Institute of Physiology imeni I. S. Beritashvili, GSSR Academy of Sciences, Tbilisi; Section of Therapeutic Radiology and Physics, Henry Ford Hospital, Detroit, Michigan USA

[Abstract] Clinical use of microwaves has recently grown in importance. Studies have shown that microwaves cause hyperoxia and change brain tissue's reaction to pure oxygen. The present article reports on study of local blood circulation in the brain as well as oxygen dynamics. Fifty-three test rabbits were given chlorpromazine in combination with ketamine. Arterial pressure was measured by catheter, while brain blood flow was recorded in various regions of the brain. Microwaves generated by a Raytheon magnetron were administered to determine their effect on these parameters. Immediate fall in blood flow to the brain was quickly followed by an increase. The changes were attributed to the heat effects of the microwaves. In a second series of tests, the medulla oblongata was exposed to microwaves. Here only brief exposure caused up to 250% increases in blood flow and 130% increases in oxygen pressure. Microwaves were found to have strong effects on brain blood flow regardless of hyperthermic effects. Figures 2; references: 9 Western.
[848-12131]

UDC 577.391;538.56;576.312.3

EFFECT OF NONTHERMAL INTENSITY MICROWAVES ON NUMBER OF ABERRANT HEPATOCYTES IN RATS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 15 Nov 82) pp 403-405

ANTIPENKO, Ye. N., KOVESHNIKOVA, I. V. and TIMCHENKO, O. I., Kiev Scientific Research Institute of General and Public Hygiene imeni A. N. Marzeyev

[Abstract] An attempt was made to show possible cumulative effect of electromagnetic field (EMF) of nonthermal intensity on mammalian chromosomes. Randomly bred white male rats were exposed to 2375 $\pm$ 50 MHz EMF with doses ranging from 10 to 500 $\mu W/cm^2$ and exposures from a single 7 hrs course to 45 daily 7 hrs sessions. A short term exposure to microwaves had no effect on aberrant cells (AC). However, the same cumulative dose extended over a long time showed a genetic effect marked by lowered AC. It could be assumed that increased doses of chronic EMF could prove to be mutagenic. Mutagenic effect was actually observed in some animals exposed to 50 $\mu W/cm^2$ dose for 20 days, along with significant increase in the functions of thyroid gland. References 7: 4 Russian (2 by Western authors), 3 Western.
[1547-7813]

UDC 539.1.047;611.431.47

ROLE OF THYROID GLAND IN DEVELOPMENT OF GENETIC EFFECTS OF NON-THERMAL INTENSITY MICROWAVES

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 15 Jan 83) pp 406-408

ANTIPENKO, Ye. N., KOVESHNIKOVA, I. V. and TIMCHENKO, O. I., Kiev Scientific Research Institute of General and Communal Hygiene imeni A. N. Marzeyev

[Abstract] In preceding paper [this journal issue pp 403-405] intensified activity of thyroid gland was noted in animals exposed to daily 50 $\mu W/cm^2$ dose of EMF for 20 days. An attempt was made in the present study to determine the role of thyroid gland in development of EMF effects observed in above paper. It was shown that in animals with intact thyroid gland there was a distinct drop of the aberrant cells (AC) after exposure to EMF, while thyroidectomized rats showed no such effect. Removal of the thyroid gland prevented the development of antimutagenic effect in animals. However, exposure to EMF decreased the mutagenic effect of excess thyroxin administered during this exposure. References 11: 9 Russian (2 by Western authors), 2 Western.
[1547-7813]

UDC 577.391:615.848.1:615.03

MODIFICATION OF ACUTE EFFECTS OF MICROWAVE IRRADIATION OF MICE AFTER INJECTION OF CORDIAMINE AND METHASONE

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 12 Oct 81) p 421

KOLDAYEV, V. M., Vladivostok State Medical Institute

[Abstract] Injection of cordiamine (100 mg/kg) and methasone (phenylephrine hydrochloride, 10 mg/kg) to mice irradiated with microwave leads to increased survival, less pronounced drop in rectal temperature and respiratory rate and faster normalization of these indexes in comparison to just irradiated animals. Manuscript #386-84, deposited in VINITI 19 Jan 84.
[1547-7813]

UDC: 612.825+613.11

DYNAMICS OF INTERHEMISPHERE ASYMMETRY UPON CHANGES IN GEOMAGNETIC FIELD

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 3, May-Jun 84
(manuscript received 19 Jan 83) pp 471-473

RAYEVSKAYA, O. S. and RYZHIKOV, G. V., Scientific Research Institute of Normal Physiology imeni P. K. Anokhin, USSR Academy of Medical Sciences, Moscow

[Abstract] The primary task of this work was to study interhemisphere asymmetry in healthy persons as a function of status of the geomagnetic field as determined by the degree of time heterogeneity of intensity. Fifteen healthy test subjects 19 to 27 years of age were used, recording EEG with eyes open and closed. The geomagnetic situation was described as a function of the dispersion of 3 hour K indexes during a 24 hour period. The development of significant time heterogeneity of the field was accompanied by changes in CNS activity as recorded by EEG. Sudden changes in geomagnetic field intensity were accompanied by smoothing of both interhemispheric asymmetry and functional asymmetry of the hands. The stability and values of functional asymmetry can be used with other indicators to describe the adaptation of the human body to variations in the geomagnetic field. References 11: 9 Russian, 2 Western.
[795-6508]

INFLUENCE OF PULSED MAGNETIC FIELD ON ELECTRICAL ACTIVITY OF RIVER CRAB NERVE CELLS

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 24 May 82; after revision 28 Dec 82) pp 681-683

SADAUSKAS, K. K. and SHURANOVA, Zh. P., Institute of Higher Nervous Activity and Neurophysiology, USSR Academy of Sciences, Moscow

[Abstract] A study was performed of the effects of a magnetic field with an induction of 2-3, 25-30 or 70 mT on the electrical activity of isolated Astacus astacus neurons. The magnetic field was created by moving a permanent magnet near the preparation; the field vector was varied by bipolar pulses of irregular shape with a repetition frequency of 0.13 or 0.26 imp/s. The experiments were performed at an interval of one day for 1.5-2 hours, with continuous recording of electrical activity. In all preparations exposed to the magnetic field, the reaction of photoreceptor neurons to light weakened in the second and third experiment, generally disappearing by the fourth. In control experiments, the reaction to light was stable, no significant changes being observed. No difference was noted between a single long or series of short exposures to the magnetic field. The magnetic field is thus found to influence the activity of the nerve cells in the isolated central nervous system of the crab. Figures 2; references 8: 5 Russian, 3 Western.
[1584-6508]

STUDY OF INFLUENCE OF MAGNETIC FIELD ON ENZYME ACTIVITY AND CALCIUM ION TRANSPORT IN Ca-DEPENDENT ATPase of SARCOPLASMIC RETICULUM

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 20 Mar 84) p 697

IVANOVA, T. O., LIVSHITS, V. A. and KUZNETSOV, A. N., Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] A detailed study is presented of the influence of magnetic fields on the value of V_{Ca} and V_{ATP} of a sarcoplasmic reticulum membrane fragment from a rabbit muscle at various temperatures and magnetic field intensities. The influence of preincubation of the sample in the magnetic field is studied with 30 minutes incubation in a field 0.7 T at 4°C. No changes in V_{Ca} and V_{ATP} are found. A second series of experiments was performed directly in a magnetic field at temperatures above, near and blow 24°C. No reliable differences were found between experimental and control specimens.
References: 1 Western.
[1584-6508]

ABSENCE OF INFLUENCE OF PERMANENT MAGNETIC FIELD ON PERMEABILITY OF MITOCHONDRIAL MEMBRANES WITH INDUCTION OF PEROXIDE OXIDATION OF LIPIDS

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 16 Mar 84) p 697

SOLOV'EVA, N. A., MOREVA, S. A., RAYKHMAN, L. M. and KUZNETSOV, A. N., Scientific Research Institute for Biological Testing of Chemical Compounds, Kupavna (Moscow Oblast)

[Abstract] A study was made of the influence of a permanent magnetic field at 0.01 - 1.0 T on the permeability of mitochondrial membranes, estimated from the degree of swelling of the mitochondria by measurement of the light permeability of mitochondrial suspensions at 520 nm and accumulation of malonic dialdehyde in rat liver mitochondria under conditions of induction of peroxide oxidation of lipids using Fe^{2+} - ascorbic acid and ascorbic acid-oxidized glutathione. The experiments were performed in various media and with mitochondria with various initial values of respiratory tests and membrane permeability. Within the limits of error of measurement no influence of the permanent magnetic field was found on mitochondrial swelling or formation of malonic dialdehyde.
[1584-6508]

STUDY OF EFFECT OF PERMANENT MAGNETIC FIELD ON PERMEABILITY OF MITOCHONDRIAL MEMBRANES UNDER CONDITIONS OF MODIFICATION BY MEMBRANE-ACTIVE COMPOUNDS

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 16 Mar 84) p 698

SOLOV'EVA, N. A., MOREVA, S. A. and RAYKHMAN, L. M., Scientific Research Institute for Biological testing of Chemical Compounds, Kupavna (Moscow Oblast)

[Abstract] A study was made of the influence of a permanent magnetic field on the permeability of mitochondrial membranes under conditions of their modification by the ionophor valinomycin, gramicidin, which forms channels, and the separator-protonophor dinitrophenol as well as antimycin A and sodium cyanide, which inhibit the respiratory chain of the mitochondria. In all cases, no influence of magnetic field was observed on the permeability of the rat liver mitochondria measured by the change in light transmission of a mitochondrial suspension at 520 nm.
[1584-6508]

UDC: 615.214.036.8 (52)

SIGNIFICANCE OF DIURNAL FACTORS FOR ACTION OF PSYCHOTROPIC SUBSTANCES

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 3, May-Jun 84 pp 13-25

ARUSHANYAN, E. B., Department of Pharmacology, Chita Medical Institute

[Abstract] Data are summarized on the significance of the best understood diurnal factors for the effects of psychotropic substances. Daily rhythms analyzed include rhythms of normal behavior, rhythms of abnormal behavior such as stereotypic motor behavior observed in animals after administration of high doses of substances such as phenamin, DOPA, etc. Various chronesthesic and chronokinetic factors form the basis for the daily fluctuation in psychotropic effect. Clear daily fluctuations are observed in the operation of activating and inactivating formations of the brain and neuromediator mechanisms which control them. This may depend on the circadian rhythm in the action of the endocrine glands. Time-dependent rhythms in assimilation, metabolism and excretion of substances are also important. References 99: 20 Russian, 79 Western.
[1579-6508]

UDC: 615.214.31.015.4:[612.822.1:547.466.3

GABA-ERGIC COMPONENT IN MECHANISM OF ACTION OF THE PSYCHOSTIMULANT SYDNOCARB

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 3, May-Jun 84 (manuscript received 14 Nov 83) pp 30-35

GANIEV, M. M., KHARLAMOV, A. N. and SHUMKOVA, O. V., Laboratory of Neurochemical Pharmacology (Headed by Professor K. S. Rayevskiy), Institute of Pharmacooogy, USSR Academy of Medical Sciences, Moscow

[Abstract] Sydnocarb is a Soviet psychostimulant from the sydnonimine derivative group which is effective in treatment of asthenoneurotic nervous-mental disorders. This article presents an estimate of the influence of sydnocarb upon one-time or long-term administration on the content

of mediator amino acids in the cerebral cortex of rats, as well as its stimulating effect in the presence of substances altering GABA-ERGIC transmission. Experiments were performed on 372 male white rats and 133 white mice using an open field method, observing movements, activity, grooming and defecation. One-time administration of sydnocarb caused an insignificant decrease in GABA content in the brain and did not change the concentration of glutamate or aspartate. Two weeks administration of sydnocarb produced a significant decrease in GABA and aspartate content with no change in the glutamate system. Valproate did not block the stimulating effect of sydnocarb. Sydnocarb potentiates the convulsive effect of thiosemicarbazide.
Figures 2; references 22: 10 Russian, 12 Western.
[1579-6508]

UDC: 615.917.547.564.3].015.4:616.36-008.9-074

KINETICS OF CHANGING LEVEL OF METAL PROTEINS AND FREE RADICALS IN RAT LIVER IN ACUTE POISONING BY 2,4-DINITROPHENOL ALKYL DERIVATIVES

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 3, May-Jun 84 (manuscript received 28 Jun 83) pp 90-93

KAGAN, Yu. S., OVSYANNIKOVA, L. M. and LUK'YANCHUK, V. D., Department of Experimental Toxicology and Pathology of Chemical Etiology (Headed by Professor Yu. S. Kagan), All-Union Scientific Research Institute of Hygiene and Toxicology, Pesticides, Polymers and Plastics, USSR Public Health Ministry, Kiev

[Abstract] The purpose of this work was to study the status of paramagnetic effects in the rat liver under dynamic conditions in acute intoxication with 2,4-dinitrophenol alkyl derivatives: 2,4-dinitro-6-methylphenol and 2,4-dinitro-6-fluoro-butylphenol (DNOK and dinoseb) used as pesticides. Experiments were performed on 180 male Wistar rats with one-time peroral administration of 1% aqueous solutions of sodium salt of DNOK or ammonium slat of dinoseb at the LD_{50}. DNOK and dinoseb cause significant changes in the electrotransport circuits of the liver cells, suppressing the energy and detoxifying systems. The greatest drop in the level of the metal proteins and free radicals studied in the liver upon administration of dinoseb occurred within thirty minutes with a subsequent trend toward recovery. With DNOK the maximum changes were recorded after six hours following administration of the poison. The mechanism of toxicity of these dinitrophenol compounds starts with acute inhibition of the functioning of iron-sulfur proteins.
Figures 1; references 12: 9 Russian, 3 Western.
[1579-6508]

UDC: 615.214.22.015.3.033

CLINICAL PHARMACOKINETICS OF MEBICAR

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 3, May-Jun 84 (manuscript received 7 Jun 83) pp 94-97

SEROV, N. V., TRESKOV, V. G., BERLYAND, A. S., KNIZHNIK, A. Z., LAPIN, K. V. and SIDOROV, A. A., Department of Bioinorganic and Biophysical Chemistry (Headed by Professor A. Z. Knizhnik), Moscow Medical Stomatologic Institute imeni A. N. Semashko; Laboratory for Study of Substances for Prevention and Treatment of Narcomania (Headed by Professor Yu. V. Burov), Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow

[Abstract] Psychotropic preparations are widely used in alcoholism treatment. However, use of tranquilizers frequently produces undesirable side effects. This article presents a clinical-pharmacokinetic study of mebicar used under hospital conditions at an industrial enterprise. Forty-two males, 26 to 51 years of age, suffering from stage II and III chronic alcoholism received 1.5 g of mebicar in 0.3 g tablets. Their condition was evaluated and blood samples were tkaen before administration of the substance, 10, 20, 30 minutes, 1, 2, 4, 8, 16, 24 and 48 hours after receiving the single dose of mebicar. EEG were recorded. It was found that mebicar is rapidly assimilated and rather slowly excreted from the body. Elimination constants are calculated. The increase in concentration of mebicar in the blood plasma during the phase of absorption corresponds to a clear and positive clinical effect. The concentrations corresponding to the time of appearance of the effect can be used as minimum effective concentrations in calculating individual treatment regimens. References 9: 8 Russian, 1 Western.
[1579-6508]

UDC: 615.916:546.48]+615.916.546.48].015.25].015.44:616-008.935.691

PENETRATION AND BONDING STRENGTH OF CADMIUM AND ITS COMPLEXES WITH DITHIOLS IN CELLS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 3, May-Jun 84 (manuscript received 28 Jun 83) pp 104-108

TRINUS, F. P., LUYK, A. I., BRAVER-CHERNOBUL'SKAYA, B. S., NOVIKOVA, N. V., LUK'YANCHUK, V. V. and CHUBENKO, A. V., Kiev Scientific Research Institute of Pharmacology and Toxicology; All-Union Scientific Research Institute of Hygiene and Toxicology of Pesticides, Polymers and Plastics, Kiev; Kiev Medical Institute imeni A. A. Bolomolets)

[Abstract] This work presents a comparative estimate of the penetration of cadmium and its complexes with the two most effective thiol complex formers--unithiol and dimercaptopropanol--into the cells and determines the influence of albumin on this process. It was found in experiments with erythrocyte

suspensions that toward the end of 1 and 1/2 hours incubation in a medium containing $1 \cdot 10^{-4}$ M free cadmium cations, 4.5 times greater concentration of metal is formed in the cells. The reverse relationship was observed in estimating the speed of elimination of cadmium from the erythrocytes. The presence of serum albumin in the incubation medium limits penetration of the metal into the cells in all cases. Cadmium penetrates into the cells 8 to 33 times faster in complex with dimercaptopropanol, 1.6 to 3 times faster in complex with unithiol than free metal cations alone. Figures 2; references 11: 3 Russian, 8 Western.
[1579-6508]

UDC: 615.218.2:617-001.28-092.9

STUDY OF CERTAIN PHARMACOLOGIC PROPERTIES OF DIMEBON ON HEALTHY AND IRRADIATED ANIMALS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 3, May-Jun 84 p 124

MATVEYEVA, I. A., IL'YUCHENOK, T. Yu. and YUROVSKAYA, M. A.

[Abstract] A study is made of the toxicologic and certain pharamcologic properties of dimebon in healthy and irradiated animals. It is found that the intoxication of mice with various methods of administration of dimebon is identical and consists of brief depression, followed by chronic-toxic convulsions with subsequent secondary long term depression. Dimebon potentiates the narcotic effect of viadryl and urethane but does not influence the effect of other analyzers studied. At higher doses (24 mg/kg instead of 6 mg/kg) it increases the duration of prostration and hyperkinesia, decreases the toxicity of strychnine, picrotoxin and corazole. Whole-body, gamma radiation does not significantly change the toxicity of dimebon i/p and i/g, increasing it for i/v administration.
[1579-6508]

UDC 612.155

CHROMATO-MASS-SPECTRAL STUDY OF SMALL INTESTINE SECRETION OF RABBITS ISOLATED AFTER EXPOSURE TO ACTION OF CHOLERA AND SALMONELLA TOXINS

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDISTINY in Russian No 7, Jul 84 (manuscript received 13 Jul 83) pp 44-46

LINBERG, L. F., ARSEN'YEVA, L. S., YURKOV, V. A. and POKROVSKIY, V. I., Laboratory of the Molecular Bases of the Pathogenesis of Infectious Diseases, Central Scientific Research Institute for Epidemiology, USSR Ministry of Health, Moscow

[Abstract] Studies of diarrhea dynamics by gas-liquid chromatography revealed that cholera and lipopolysaccharides of salmonella promote growth

of small-molecular weight compounds in the small intestines. To determine the chemical structure of such compounds, the authors analyzed silylated secretion specimens on a chromato-mass-spectrometer. Data analyzed by computer showed that the metabolites found were of various chemical types. Synthetic biological specimens were used for further identification, but data remained insufficient. Toxins were shown to lead to accumulation of metabolites at various times. Fatty acids, cholesterol and hydroxy acids were identified, but further study is required to pinpoint the exact nature of toxin effects. Figures 2; references 4: 2 Russian, 2 Western.
[484-12131]

STUDY OF CHANNEL-FORMING OF PROPERTIES OF STEATODA PAYKULLIANA SPIDER VENOM

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 16 Jun 83) pp 620-623

SOKOLOV, Yu. V., CHANTURIYA, A. N. and LISHKO, V. K., Institute of Biochemistry imeni A. V. Palladin, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] Some biological toxins form ion channels in bilayer lipid membranes. This work demonstrates that the venom of the spider Steatoda Paykulliana contains a protein which forms ion channels which are reminiscent of latrotoxin channels in their properties. The conductivity of individual channels is somewhat less than that of latrotoxin channels, averaging 27-30 pSm in a solution containing 10mM $CaCl_2$. The properties of the channels are also quite similar to the properties of Ca channels in excited membranes. The selectivity for bivalent cations and shape of the volt-ampere characteristics are qualitatively similar. As in the case of a Ca channel, blocking of an ion channel formed by the venom is effectively performed by cadmium ions. The results indicate that the channels can serve as a convenient model for studies of the properties and possibly the structure of the calcium channels in excited membranes. Figures 3; references 12: 8 Russian, 4 Western.
[1584-6508]

QUANTITATIVE LINEAR CALCULATION OF TOXIC EFFECT OF ETHANOL ON LIVER IN MODEL OF CHRONIC ALCOHOL INTOXICATION

Moscow BIOFIZIKA in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 16 Feb 84) p 698

ZHUKOTSKIY, A. V., SHCHEGOLEV, A. I., YAVORSKIY, A. N. and KOGAN, E. M., Second Moscow State Medical Institute imeni N. I. Pirogov

[Abstract] A study was made of rat livers in chronic alcohol intoxication caused by various doses of ethanol. Quantitative analysis of hepatocyte nucleus chromatin structures was performed on a PDP-12/20 computer. Experimental data revealed a correlation between ethanol dose and the

gradient parameter representing the structural state of the nucleus chromatin. Correlation-regression analysis was performed on the relationship between this parameter and the glycogen content in the tissue. The gradient parameter suggested for quantitative evaluation of the degree of alcohol damage to the liver was found to be twice as accurate as the karyometric and histochemical methods and correlated with the content of glycogen in the tissue. Regression equations are presented which allow prediction of the histochemical parameters. [1584-6508]

UDC: 616.371:579.843.1].07

STUDY OF CHOLERA CHEMICAL VACCINE "CHOLEROGEN-ANATOXIN" ENRICHED WITH OGAWA O-ANTIGEN

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 4, Apr 84 (manuscript received 8 Jun 83) pp 70-74

DZHAPARIDZE, M. N., MIKITINA, G. P., KULIKOVA, V. L., POPOV, A. A., NAUMOV, A. V., KOTKINA, T. A., GRACHEVA, V. N., DOBROVA, M. V. and KOVALENKO, N. M., All-Union Scientific Research Antiplague Institute "Mikrob", Saratov

[Abstract] A study is presented of the possibility of enriching the commercial cholera chemical vaccine "colerogen-anatoxin" plus Inawa O-antigen with the somatic Ogawa antigen. Eight experimental series of cholera chemical vaccine containing anatoxin and Inawa and Ogawa O-antigens were studied, as well as 5 series of Ogawa O-antigens. The study was begun by determining the chemical and antigen composition of the culture of the fluids which were initial materials for isolation of the cholera vibro antigens. It was established that in Ogawa strains in the culture fluid which was the initial substrate for isolation of the O-antigen there was a large quantity of dissolved O-antigen and the Ogawa O-antigen also differs greatly from all other accompanying components in molecular mass. Study of the antigen-immunogen properties of the preparations obtained showed that enrichment with Ogawa antigen increases the capability of vaccines to cause the formation of specific vibriocidal antibodies and to protect white mice from infection with Ogawa strains by an average factor of 3. The Ogawa O-antigen enriched vaccine does not differ in residual toxicity from the initial vaccine but does create greater immunity against Ogawa cholera vibrios. Figures 1; references 13: 7 Russian, 6 Western. [1528-6508]

UDC: 612.82.015.3.014.46:615.214.2

CHARACTERISTICS OF ULTRASLOW ACTIVITY AND BRAIN TEMPERATURE UNDER INFLEUNCE OF NEUROTROPIC SUBSTANCES

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 4, Jul-Aug 84 (manuscript received 20 Jun 83) pp 18-21

LPAINA, I. A., YAICHNIKOV, I. K., SHABANOV, P. D. and FILIPOVICH, A. I., Department of Pharmacology of Memory and Behavior (headed by Professor Yu. S. Borodkin), Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad

[Abstract] A study is made of the influence of 1,ethyl-4,5-di-(N-methylcarbamoyl)-pyrazole (IEM-476), 1-allyl-4,5-di-(N-methylcarbamoyl)-pyrazole (OEM-474) and their immidazole ethimizole analogs and 1-ethyl-4,5-di-(N-methylcarbamoyl)-imidazole (allylnorantiffein) on the amplitude and frequency of multisecond and multiminute fluctuations in ultraslow activity and brain structure temperature, reflecting the general level of cerebral metabolism. Ethimizole increases the amplitude and frequency of fluctuations in ultraslow activity of most of the brain structures studied in 7 rabbits. The data indicated a change in overall metabolism in the neuron-glial population accompanied by restructuring of intracentral relationships. IEM-476 and IEM-474 influence the overall metabolic level like their immidazole analog but over a shorter period of time. A similar effect of the preparations on these indices confirm the need for further study of the mechanism of their actions. Figures 2; references 6: 5 Russian, 1 Western.
[1578-6508]

UDC: 612.014.467:615.31:547.891.2

SPECTRA OF PHARMACOLOGIC ACTIVITY OF ENDOGENOUS BENZODIAZEPINE RECEPTOR LIGANDS AND THEIR STRUCTURAL ANALOGS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 4, Jul-Aug 84 (manuscript received 28 Jun 83) pp 25-28

AKHUNDOV, R. A. and VORONINA, T. A., Department of Psychopharmacology, Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow

[Abstract] A study is presented of the psychopharmacologic properties of endogenous benzodiazepine receptor ligands inosine, nicotinamide and its structural analogs--ethyl esters of nicotinic acid NMF and AzN in comparison to diazepam in order to determine the spectrum of pharmacologic activity of these substances and their location in the sequence of benzodiazepine preparations. Experiments were performed on mongrel male mice and rats. The sedative effect, anticonvulsive effect, myorelaxant effect and tranquilizing effect were studied. The pharmacologic effects of inosine appear in the dose range 800-3000 mg/kg. It is most effective in the test of potentiation

of hexenal sleep, suppression of orientation reflex and motor activity in an open field. A dose of 2000-3000 mg/kg causes myorelaxant effects and corasole antagonism. Nicotinamide like inosine is primarily sedative, antiagression and corasole antagonism appearing only at doses of 1000 mg/kg or more. NMF and AzN also have psychotropic effects characteristic of benzodiazepine preparations. NMF and AzN are intermediate in psychotropic activity between diazepam and the endogenous benzodiazepine receptor ligands inosine and nicotinamide. Figures 2; references 15: 7 Russian, 8 Western.
[1578-6508]

UDC: 612.821.6

STUDY OF ANTIAMNESTIC PROPERTIES OF PYRAZOLE DICARBOXYLIC ACID DERIVATIVES IN RATS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 4, Jul-Aug 84 (manuscript received 26 Jul 83) pp 28-30

SHABANOV, P. D. and ALEKSANDROVA, I. Ya., Departments of Pharmacology of Memory and Behavior (headed by Professor Yu. S. Borodkin) and of Pharmacology (corresponding member of USSR Academy of Medical Sciences, Professor I. S. Zavodskaya), Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad

[Abstract] Experiments were performed on 210 male rats. A conditioned passive avoidance reaction was developed in all the animals. The trained animals then received an isotonic saline solution or one of the pharmacologic substances intraperitoneally. Substances tested included 1-R-4,5-di-(N-methylcarbamoyl)-pyrazoles, where R=CH_3 (IEM-565), C_2H_5 (IEM-476), C_3H_7 (IEM-1332), C_3H_5 (IEM-474) and 1-R-3,4-di-(N-methylcarbamoyl)-pyrazoles, where R=CH_3 (IEM-373), C_2H_5 (IEM-440, ethyrazole, ethipyrole), C_3H_7 (IEM-1333), C_3H_5 (IEM-439). All substances were administered at 10 mg/kg in not over 0.5 ml during a period of generalized convulsions caused by electroconvulsive shock. Retention of learning in the animals was tested 24 hours later. Of all the compounds studied, the ability to eliminate amnesia caused by electroconvulsive shock was observed in IEM-476, IEM-373, and IEM-439. The remaining compounds had no influence on the amnestic effect of electroconvulsive shock. References: 6 Russian.
[1578-6508]

UDC: 616-008.9-02:613.863]-092.9-085.21+615.21.015.4:616-008.9-02:613.863

NEUROPHARMACOLOGIC ASPECTS OF REGULATION OF CERTAIN BODILY FUNCTIONS UNDER ACOUSTIC STRESS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 4, Jul-Aug 84 (manuscript received 5 Jul 83) pp 44-46

KOSTYUCHENKOV, V. N. and SMYCHKOV, V. F., Department of Physical Training, Sports Medicine and Therapeutic Physical Culture (headed by Docent V. N. Kostyuchenkov), Smolensk Medical Institute

[Abstract] The purpose of this work was to study the influence of neuropharmacologic preparations on the course of stress and biochemical changes in the body upon exposure to a sound stimulus. Experiments were performed in 180 white rats of both sexes, placed individually in an acoustic chamber. Stress was created by bell sound at 130 dB. The bell was disconnected when convulsions started or after 5 minutes if development of convulsions was prevented by the medications tested. After the experiments the acid-alkaline state of the blood was determined, as well as the content of lactic acid, ATP, urea, nonesterified fatty acids and sugar. Preparations studied included aminazine, haloperidol, chloroprotiksin, diazepam, barbamil, apressin, pentalamine, anaprilin, dopagite and benzohexonium, administered subcutaneously one hour before the sound stimulus. In control animals, the sound stimulus caused motor excitation in 10 seconds, convulsions in 1±0.08 minutes which passed gradually after the sound was shut off, being replaced by general weakness. Disruptions in acid-alkaline status, carbohydrate, protein and fat metabolism also occurred. Aminazine, diazepam, barbamil and anaprilin decreased the content of lactic acid and increased the concentration of sugar in the blood. Diazepam and barbamil have the strongest effect. Aminazine and dopagite actually increase the content of ATP. The studies showed that some of the substances greatly normalized glycolytic and energy forming processes. The changes occurring in the body under the sound stimulus are reflex in nature involving primarily the central and sympathetic nervous systems. The most effective substances were barbamil, diazepam, aminazine and pentalamine. References 9: 6 Russian, 3 Western.
[1578-6508]

UDC: 615.916.546.16].065.03:615.23

OXYGEN BALANCE AND INFLUENCE OF ANTIHYPOXIC PREPARATIONS IN FLUORINE INTOXICATION

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 4, Jul-Aug 84 (manuscript received 29 Jul 83) pp 94-97

SHUGAYEV, V. A., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] A study was done of the influence of inorganic fluorine compounds with long-term inhalation exposure on certain oxygen balance indices of the

body in order to estimate the effect of a number of antihypoxic preparations in fluorine intoxication. Experiments were performed on mature male white rats and mice. The animals were exposed for 2 months (5 hours per day) to inhalation of hydrogen fluoride at 0.58 and 2.75 mg/m^3. Oxygen utilization rates and tissue respiration were studied. In testing the antihypoxic preparations, a model of intoxication was created by repeated intraventricular or intraperitoneal administration of NAF. Preparations studied include ATP, ADP, AMP, adenosine, NAD, NAD-N, NADP, apressin, bemityl, glutamic acid, gutamine, pyruvate, glucoso-1-phosphate, glucoso-6-phosphate, fructose-6-phosphate, cytochrome c and sodium oxybutylate. The experiments showed that fluorine intoxication disrupts oxygen and energy metabolism leading to the development of tissue hypoxia. The adenine nucleotides apressin, bemityl, gutamine and glutamic acid had a therapeutic effect. NAD, NADP, cytochrome c and sodium oxybutylate had no marked therapeutic effect. References: 16 Russian.
[1578-6508]

UDC: 615.9:546.79(049.32)

TECHNOLOGY OF RADIOACTIVE SUBSTANCES (BOOK REVIEW)

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 4, Jul-Aug 84 pp 117-118

IVANIKOV, A. T., doctor of biological sciences, Moscow

[Abstract] This is a review of the book "Toksikologiya radioaktivnykh veshchestv" by V. F. ZHURAVLEV, Moscow, Energoatomizdat Press, 1982, 128 pages. The monograph reviewed is dedicated to a pressing problem of radiation medicine: the toxicology of the radioactive substances used. Chapter 1 studies general problems of the toxicology of radioactive substances and contains very useful information on the paths of entry of these substances into the body, resorption coefficients and their variations as functions of physical and chemical properties of the radionuclides. In describing the biological effects of radioactive substances the author analyzes the effects they cause from the standpoint of action of ionizing radiation on the body. In the section on radiobiological principles of standardization of radioactive substances, the problem of means and principles of transfer of the results of experimental studies to man, as well as modern approaches to standardization of radioactive contamination, is studied. The author shows various paths and principles for approaching the transfer of data from animals to man. The book is a significant contribution to the toxicology of radioactive substances.
[1578-6508]

UDC: 615.324:593/.594

STUDY OF CASPIAN MOLLUSKS FOR PRESENCE OF BIOLOGICALLY ACTIVE SUBSTANCES OF INTEREST FOR PHARMACY

Moscow FARMATSIYA in Russian Vol 33, No 4, Jul-Aug 84
(manuscript received 22 Feb 84) pp 22-24

MEKHTIKHANOV, S. D., Dagestan Medical Institute

[Abstract] A study was made of the possibility of isolating biologically-active glycoprotein compounds from Caspian mollusk tissues. Qualitative analysis of the elemental composition of water extracts of mullusks identified mercenine, an antineoplastic agent for certain neoplasms, similar in composition to lyophilizates of Caspian mollusks. The product obtained was analyzed in terms of elemental and amino acid composition by disk electrophoresis in polyacrylamide gel. It was found that distilled water extracts from the Caspian mollusks Mytilaster lineatus, Dreissena polymorpha and Dreissena rostriforms contained biologically active complexes--heterogeneous proteins similar in chemical composition to known glycoprotein substances mercenine and chalones. References: 5 Western.
[1604-6508]

NEUROPEPTIDES

Moscow LENINSKOYE ZNAMYA in Russian 10 Jul 84 p 3

[Article by Yu. Andreotti (Novosti Press Agency)]

[Text] Soviet scientists are doing much work to develop basically new forms of drugs which, having maximum efficacy, would be utterly harmless. Neuropeptides, which are proteins synthesized by the brain of vertebrate animals and man, will become the foundation for one of the future branches of pharmacology. R. KRUGLIKOV, doctor of medical sciences, laboratory head at the Institute of Higher Nervous Activity and Neurophysiology, USSR Academy of Sciences, tells us about research in this area:

At present, several dozen various neuropeptides (NP) have been investigated. It is assumed that there are several hundred of them in the brain. Scientists first learned about them more than 20 years ago. At that time, experiments revealed that if part of the brain--the hypophysis--is removed from animals their capacity for learning and retention of what is learned is drastically diminished. With exogenous administration of hormones produced by the pituitary, there is restoration of capacity for learning and retention. In these experiments, scientists encountered a curious fact when animals were given only part of a hormone, rather than the whole, for example, adrenocorticotropic hormone (ACTH). The ACTH molecule is large and it contains 39 successively linked amino acids. And it was sufficient to give an animal only specific small fragments of this molecule to restore memory and learning capacity. These parts of the ACTH molecule, which consist of only 4-8 amino acids, were among the first neuropeptides, with which experiments were performed.

Scientists obtained more effective and lasting restoration of memory in experiments with vasopressin. This hormone regulates fluid-electrolyte metabolism in vertebrate animals and man. The part with hormonal action was removed from the vasopressin molecule. The remaining fragment restored memory rapidly and for a longer time when given to an animal. And it affected an enormous number of cerebral neurons simultaneously.

At the present time, the intensive increase in studies of neuropeptides has been replaced with interpretation of the mechanisms of their action on the body's biochemical and physiological systems. We encountered many "oddities"

in the behavior of neuropeptides. It turned out that each of them regulates several body functions simultaneously and, at the same time, each function is controlled by several neuropeptides.

It was also learned that neuropeptides have amazing activity. One hundred-millionth and sometimes billionth of a gram already has a noticeable effect. It has happened that an inexperienced experimenter wanted to obtain better results and increased administered dosage markedly, but the effect disappeared. At the same time, depending on dosage, the same neuropeptide can manifest different properties. For example, it improves memory in minimal amounts and removes pain in somewhat larger doses.

All naturally occurring neuropeptides are very unstable and they disintegrate in the body within literally minutes. Organic chemists have succeeded in synthesizing most neuropeptides and their analogues, which have a long shelf life and are protected against the dissociating effect of body enzymes. In the example with pituitary hormone, it was possible to develop a neuropeptide a million times more active than the naturally occurring one by means of slight modification of one of its constituents. And this shows that we are already on the road toward really developing some very effective drugs.

Some neuropeptides are already being used in clinical practice. For example, in the course of our studies we learned that vasopressin secures developed conditioned reflexes. One of the methods of treating alcoholism is expressly based on development of an aversion reflex for alcoholic beverages. But some patients return to their old habit some time after being discharged from a dispensary. If, however, a patient is given vasopressin during treatment of alcoholism, there is drastic increase in persistence of the developed reflex. In any event, since the new method of treatment was begun, and it has been in use for 1.5 years already, most patients did not return to drinking. Soviet specialists have priority in this work.

As another example, we can mention dilargin, a new neuropeptide developed in the USSR. It is good in the treatment of some gastric diseases. It has successfully passed experimental clinical trial at the All-Union Cardiological Research Center. But before the question of use in clinical practice is definitively answered it will have to undergo several more trials; in our country, each new drug undergoes the world's most rigorous trial before it reaches physicians.

Soviet scientists have made another interesting discovery--they found on neurons of the brain some receptors that are sensitive to opiates, i.e., narcotics, for example, morphine. In the course of the studies it was found that they have the same analgesic effect as morphine, while some of their modifications are hundreds and even thousands of times stronger than this narcotic of plant origin. With this knowledge, it is possible to develop some excellent analgesics.

Recently, several neuropeptides have been isolated that could affect human immunity and resistance to infectious diseases. If the predictions for one of them, tuftsin, are confirmed in the course of investigations, physicians will gain a powerful agent for the prevention of many diseases of this type.

At present we know exactly which neuropeptides cause the sensation of hunger, of satiety and thirst, which ones cause the sensation of satisfaction, stimulate motor activity or make one sleepy, provide the capacity for learning or improve memory, which affect the stomach or heart, which raise temperature or blood pressure.... As we gain more knowledge about the functions and mechanisms of action of neuropeptides, new avenues will be disclosed for development of unusual, but not alien to man, drugs.

10,657
CSO: 1840/823

HIGH VOLTAGE EFFECTS MEASURED ON DUMMY MANNEQUIN

Frunze SOVETSKAYA KIRGIZIYA in Russian 14 Sep 84 p 3

[Article by S. Shpungin]

[Text] How to determine the level of the effects which electric fields of high-voltage equipment produce on persons who are nearby? Scientists of the Riga Polytechnic Institute and the Yurmala branch of the All-Union Scientific Research Institute of the Cable Industry have found an original solution to this problem. They have developed a mannequin equipped with remote control instruments.

Instruments register weak currents which occur. Pickups, an amplifier, a switch and a number of other devices are concealed within the mannequin. An operator commands them from a remote control unit. Information is analyzed at once by a microcomputer, which calculates the intensity of the electric field on various sections of the mannequin's surface. Such information is needed for medical-biological research.

The immediate purpose of this unusual "assistant" is to further ensure work safety for persons who service high-voltage lines and industrial and research units that are exposed to voltage.

The testing of antistatic suits is one possible application of this innovation. A mannequin dressed in such clothing quickly tests its reliability. If the suit's protective properties are impaired anywhere, instruments indicate the place.

FTD/SNAP
CSO: 1840/010

UDC 612.858.72:612.822

REACTIONS OF NEURONS OF VARIOUS HEARING SYSTEMS LEVELS IN BATS TO FM SIGNALS WITH HARMONIC MODULATION

Leningrad VESTNIK LENINGRADSKOGO UNIVERSITETA: BIOLOGIYA No 9, Issue 2 in Russian 1984 (manuscript received 8 Feb 83) pp 59-65

VINOGRADOVA, Ye. P., VASIL'YEV, A. G. and ANDREYEVA, N. G.

[Abstract] Previous studies had shown frequency modulation to affect hearing reactions in bats, but did not identify various levels of the hearing system in this process. The present article reports on reactions of two species of bats, Rhinilophus ferrum-equinum and Myotis blatti, to FM signals with changing frequencies according to the sinusoidal principle. As a control group, other bats were subjected to AM as well as FM variations. The level of response was found to depend on the beginning level of the signal: if the signal began with falling frequency, the response level was highest, but if it coincided with a rise in frequency, less reaction was observed. The range of synchronized discharge varied for the cochlear nuclei (50-2000 Hz), superior olivary (50-2000 Hz), inferior colliculus (20-200 Hz) and the auditory cortex (1-20 Hz). Figures 4; references 15: 9 Russian, 6 Western.
[851-12131]

UDC: 612.826

PARTICIPATION OF NEURONS IN VARIOUS SEGMENTS OF THE HYPOTHALAMUS IN BODY REACTION TO HYPOXIA

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 6, Jun 84 (manuscript received 31 Oct 83) pp 747-751

YANVAREVA, I. N., KUZ'MINA, T. R. and VERBIANOVA, O. M., Department of Human and Animal Physiology (headed by A. D. Nozdrachev), State University imeni A. A. Zhdanov, Leningrad

[Abstract] Experiments were performed on nembutal-narcoticized immobilized and artificially respirated calves. Microelectrodes on the brain surface were

used to monitor. The status of hypoxia evoked by blood loss or disconnection of artificial respiration from 3 to 5 minutes. Background impulse activity and arterial pressure were recorded throughout the experiment and results of experiments processed statistically. The following parameters were studied to analyze the sequence and nature of reaction of background, active hypothalamus neurons to oxygen deficit: the latent period of the activation stage, time of disappearance and time of restoration of background pulse activity of neurons. The study indicated different latent periods of the stage of activation and nonsimultaneous disconnection of electric activity of neurons in various nuclei of the hypothalamus upon development of oxygen insufficiency and convincingly demonstrated that the anterior segments are involved during the beginning of excitation, which then propagates to the structures of the posterior hypothalamus. The neurosecretory elements of the anterior hypothalamus apparently perform an initiating role in the development of compensatory-adaptive reactions within the hypothalamus. Figures 2; references 20: 17 Russian, 3 Western.
[798-6508]

UDC: 612.89+612.813

NATURAL ELECTRICAL ACTIVITY OF HUMAN SYMPATHETIC NERVE FIBERS, RECORDED FROM BODY SURFACE

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 5, May 84 (manuscript received 4 Jan 84) pp 589-593

GERZANICH, V. V., LUSAYCHUK, Yu. S., REMIZOV, I. N. and SKOK, V. I., Department of Physiology of Autonomic Nervous System (headed by V. I. Skok), Institute of Physiology imeni A. A. Bogomolets, Ukrainian Academy of Sciences; Institute of Clinical and Experimental Surgery, Ukrainian SSR Ministry of Health, Kiev

[Abstract] An attempt was recently made to record sympathetic nerve fiber activity from the surface of the skin without using transcutaneous electrodes. Coherent accumulation of signals synchronous with the cardiac rhythm was used to separate the signal from noise. However, in spite of the collar used to restrict blood flow, it was still possible that the electrical wave recorded was a flow potential or some other phenomenon of purely physical origin related to the movement of blood through the vessels. The present study was performed on test subjects, some of whom had post-traumatic denervation of one of the upper extremities. Electrical potentials were recorded from the forearm with transcutaneous electrodes surrounding the extremity. In the period of the cardiac cycle in which the electrogram records component II, which is absent in the denervated extremity, the rheogram of the denervated extremity is no different from that of the normal extremity. The propagation rate of the rheogram component arising in the normal and absent in the denervated extremity is such that it may correspond in time to the development of component II of the electrogram, considering the difference in the rate of recording of the two reactions. The results produced in this study thus show that component II of the electrogram taken from the surface of the

forearm by coherent accumulation of the pulse rhythm does reflect tonic sympathetic nerve activity. Figures 2; references 6: 2 Russian, 4 Western.
[799-6508]

UDC: 612.821.6

NIGRO-STRIAL DOPAMINERGIC SYSTEM AND ITS SIGNIFICANCE IN ADAPTIVE CONDITIONED REFLEX BEHAVIOR

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 5, May 84 (manuscript received 19 Dec 83) pp 594-600

SUVOROV, N. F., YAKIMOVSKIY, A. F. and SAUL'SKAYA, N. B., Laboratory of Physiology of Higher Nervous Activity (headed by N. F. Suvorov), Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences, Leningrad

[Abstract] A discussion is presented of a system which is nonspecific for conditioned reflexes - the nigro-strial system. The work contains experimental material obtained in recent years in the Laboratory of Physiology of Higher Nervous Activity, Institute of Physiology imeni I. P. Pavlov concerning neostrial mechanisms of adaptive conditioned reflex behavior. The experiments were performed on 110 male Wistar white rats and 7 male dogs. The studies with administration of dopamine precursors showed that in the nigro-strial system the activity of dopamine liberation is actually increased with increasing complication of the reflexes developed. A similar result was produced in the pharmacologic series of experiments on rats. Development of discrimination conditioned avoidance reflex in rats with time shortage was extremely difficult. The data obtained in the experiments indicate involvement of the nigro-strial dopaminergic system in provision of conditioned reflex avoidance. In the series of experiments on dogs the influence of microinjections of dopaminemimetics into the head of the caudate nucleus on development of positive conditioned food reflex was studied. The function of the dopaminergic nigro-strial and nitro-hypothalamic connections is combined by a single purpose--regulation of adaptive behavior. In both cases the function was performed through a close relationship with the enkephaline containing mediator system. The data obtained indicate that the nigro-strial system is more closely related to regulation of conditioned or reflex forms of adaptive behavior, while the nigro-hypothalamic system is related to unconditioned reflex behavior, though both are related to correcting nonspecific conditioned reflex mechanisms. Figures 4; references 20: 16 Russian, 4 Western.
[799-6508]

UDC: 612,21+612.28

PHARMACOLOGIC ANALYSIS OF REGULATION OF DURATION OF RESPIRATORY CYCLE PHASES

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 5, May 84 (manuscript received 13 Dec 83) pp 722-727

VORONOV, I. B., ZIMIN, A. L. and RUKOYATKINA, N. I., Laboratory of Pharmacology (headed by A. F. Danilov), Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, USSR Academy of Sciences, Leningrad

[Abstract] Cats narcoticized with urethane and chloral were used in a study of changes in the duration of inspiration and expiration phases in the respiratory cycle with extracerebral M-cholinoreceptors blocked upon i/v administration of arecolin, oxotremoin, eserine and armine. The time of inspiration and the time of expiration (TI and TE) were determined and mathematically analyzed. Based on the data obtained from studies of 20 cats with intact vagus nerves, TI is 1.84±0.65 s, TE is 2,66±1.5 s, TI/(TI+TE)-0.41±0.06. After vagotomy, TI=2,46±0,49 s, TE=3,50±0,94 s, TI/(Ti+TE=0.42±0.8. Administration of mectacine at 1 mg/kg i/v to block extracerebral M-cholinoreceptors without crossing the blood-brain barrier, did not change TI and TE. Administration of metacine plus small doses of substances capable of penetrating the hematoencephalic barrier and stimulating M-cholinoreceptors of cerebral neurons for preventing breakdown of endogenous acetylcholine by cholinesterase in all cases cause a decrease in the TI fraction of the respiratory cycle by 30 to 40% of the initial level. Inhibition of central inspiratory activity upon administration of M-cholinomimetics was described previously. Separate recording of the TI and TE changes caused by pharmacologic substances allows production of additional information on the neurotransmitter organization of neuron complexes responsible for the duration of these phases. The differences observed in the data obtained on the role of cholino- and catecholaminergic systems of the brain in regulation of respiration cycle duration and the data on changes of activity of identified respiratory neurons upon exposure to acetylcholine and noradrenaline, are quite significant for further study of neuron organization of the respiratory center. Figures 5; references 7: 3 Russian, 4 Western.
[799-6508]

UDC: 612.13

DISTRIBUTION OF BLOOD FLOW TO BRAIN, KIDNEYS, GUT, SPLEEN AND POSTERIOR EXTREMITIES IN CATS IN ACUTE HYPOXIA

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 5, May 84 (manuscript received 3 Nov 83) pp 728-731

IRIPKHANOV, B. B., KRIVCHENKO, A. I. and MOSKALENKO, Yu. Ye., Laboratory of Comparative Physiology of Circulation (headed by Yu. Ye. Moskalenko , Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, USSR Academy of Sciences, Leningrad

[Abstract] Studies were performed on 26 cats of both sexes under chlorase and nembutal narcosis. Blood flow to the kidney, gut and spleen was determined by the hydrogen clearance based on analysis of curves of hydrogen clearance recorded in venous blood of the corresponding organs by electrodes applied to the surface of the veins. Hypoxia was created by inhalation of a mixture of gases (90% N_2 and 10% O_2) for 3 minutes. None of the changes in organic blood flow measured were related to changes in arterial pressure, which did not change over 2% throughout the entire period of acute hypoxia. Analyzing the blood flow changes in the individual organs, the authors found that adaptive reactions arise in the cardiovascular system intended to compensate shortages of oxygen primarily in organs vital to survival. The varying sensitivity of the vessels of the organs to arterial P_{O_2} leads to the possibility of redistribution of blood in acute hypoxia.
Figures 1; references 9: 6 Russian, 3 Western.
[799-6508]

SPECIFICS OF HORMONAL PROFILE IN PRACTICALLY HEALTHY PERSONS LIVING IN VARIOUS GEOCLIMATIC ZONES

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 10, Oct 83 pp 26-28

KHUSEYINOV, F. Kh., BALYURA, A. V., BABAKULYEVA, D. and NIKOGOSYAN, G. K. TSSR Ministry of Health, Moscow Scientific Research Institute of Oncology, imeni P. A. Gertsen (Director - Doctor of Medical Sciences, V. I. Chissov)

[Abstract] A study was made of the hormonal profile of a group of healthy persons living under various geoclimatic conditions. The study was stimulated by the possible influence of various climatic conditions on the thyroid function. The titers of thyroxin, triiodothyronin, thyreotropic hormone, somatotropic hormone and prolactin were determined in the blood serum of 58 persons living in an arid zone and 75 living in the RSFSR. Analysis of the data obtained revealed a statistically reliable difference in the figures for certain hormones among the groups compared. Results from persons living in the arid zone during the hot season revealed significant changes, with thyroxin and triiodothyronin three times lower than similar results in winter, 1.5 times lower than in residents of the RSFSR. The results

thus confirm that extremely high air temperatures, intensive solar radiation and other extreme factors significantly depress the thyroid and hypophysis function. References: 6 Russian.
[1609-6508]

UDC: 612.821+612.822.3

CENTRAL REGULATION OF SENSORY FLOW IN HUMAN VISUAL SYSTEM

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 3, May-Jun 84
(manuscript received 27 Jul 83) pp 339-346

IVANITSKIY, A. M., KORSAKOV, I. A. and TATKO, V. L., All-Union Scientific Research Institute of General Forensic Psychiatry imeni V. P. Serbskiy, Moscow

[Abstract] Studies were performed on 21 healthy volunteers, who were seated in a dark, anechoic chamber and received bilateral stimulation through light guides. The evoked potentials in response to various intensities of light flashes were recorded under the control of a French computer. The subjects were to press a button in response to a given sequence of flashes. Instructions given before the experiments influenced the perception of the subjects. If experimental instructions were intentionally incorrect, evoked potentials corresponded to the expected stimulus rather than the actually presented stimulus. Failure to notice changes in intensity which had been correctly predicted in the instructions resulted from spontaneous fluctuations in perceptive characteristics of the visual analyzer. References 15: 12 Russian, 3 Western.
[795-6508]

UDC: 612.825.2

LATERAL SPECIFICS OF VISUAL PERCEPTION

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 3, May-Jun 84
(manuscript received 28 Oct 82) pp 347-351

MANELIS, N. G. and GREBENNIKOVA, N. V., Institute of Psychology, USSR Academy of Sciences, Moscow

[Abstract] An attempt was made to determine the specific processing of visual information on the left and right cerebral hemispheres during performance of various tasks involving geometric figure shape recognition. As experiments continued, the number of classes of characteristics to be recognized was increased, which should have made the task more difficult for the left hemisphere. Studies were performed on 10 healthy test subjects 25 to 45 years of age. Patterns were presented 12° to the left or right of

the point of fixation for periods of 5 to 20 ms, adjusted individually. Analysis of errors made indicated that the right hemisphere coped with the pattern recognition tasks better than the left if the stimulus consisted of two sets of characteristics (shape and complexity). The left hemisphere, it is concluded, evaluates various characteristics of the stimulus sequentially. The external form of the figures is first perceived, after which the question of the presence of an internal contour is answered. If time is short, this sequence analysis of the stimulus cannot be completed. In contrast to the left hemisphere, the right hemisphere seems to perceive both parameters of the stimulus, form and complexity, simultaneously. Figures 3; references 16: 5 Russian, 11 Western.
[795-6508]

UDC: 617.51.001.36:617.7

VISUAL EVOKED POTENTIALS WITH DISRUPTED FUNCTIONING OF NONSPECIFIC CEREBRAL SYSTEMS

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 3, May-Jun 84 (manuscript received 11 Jan 83) pp 352-357

SKLOVSKAYA, M. L. and ISHMUKHAMETOV, A. I., Scientific Research Institute of Emergency Medicine imeni N. V. Sklifosovskiy, Moscow

[Abstract] A study was made of visual evoked activity--since the conducting paths of the visual analyzer do not pass through the brain stem--in order to study the influence of damage to nonspecific brain stem structures. Studies were performed on 32 patients with closed skull-brain trauma 1 to 2 days after injury, and on 37 healthy test subjects. EKG and evoked visual potentials were recorded. Component analysis revealed an increase in the time of peak latency of practically all components of evoked potentials among the accident victims. A significant increase in amplitude of H_3 component was characteristic, usually bilaterally. Changes were primarily seen in the late components of the visual evoked potentials. The nature of amplitude changes in late components was mixed: the increase in H_3 component was accompanied by a decrease in P_4 and H_4. The change in amplitude-time characteristics of these components are thought to be electrographic reflections of disruptions of normal interrelationships in the limbic and reticular systems of the brain. Figures 2; references 19: 11 Russian, 8 Western.
[795-6508]

UDC: 612.821:616.891

EFFECT OF SYNTHETIC PITUITARY NEUROPEPTIDES ON OPERATION OF HUMAN VISUAL ANALYZER

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 3, May-Jun 84 (manuscript received 22 Nov 82) pp 358-363

KORBANOV, V. V., BAKHAREV, V. D., RYZHOVA, L. A., ZAGRYADSKIY, P. V., NEZAVIBAT'KO, V. N., PONOMAREVA-STEPNAYA, M. A. and ALFEYEVA, L. Yu., Military-Medical Academy imeni S. M. Kirov, Leningrad

[Abstract] The purpose of this work was to determine the specific effects of preparations of an $ACTH_{4-10}$ analog (Met-Glu-His-Phe-Pro-Gly-Pro) and desglycine arginine vasopressin (DGAVP) on light and dark adaptation of the human visual analyzer and the dimensions of the visual field with mesopic illumination. The authors of the experiments studied the status of the visual function in mesopic and scotopic conditions and the adaptation capacity of the visual analyzer before and after ingesting the preparation, using themselves as subjects. Both the neuropeptides were found to accelerate adaptation processes in the visual analyzer. Acceleration of binocular readaptation was greater than monocular readaptation after taking DGAVP, indicating the preferential action of this preparation on the neurodynamics of the cortical segments of the analyzer. Coordination control of the central elements of the analyzer in the interaction of broad and stem afferent systems was confirmed by the greater effect of the preparations under mesopic conditions after rhythmic light stimulus. The ACTH analog can influence light perception. The points of application of the peptides are found to be the cortical segments of the sensory system. Figures 2; references 10: 6 Russian, 4 Western.
[795-6508]

UDC: 612.822.3.087+612.76

CHANGE IN RELATIONSHIP OF BIOPOTENTIALS OF BRAIN ZONES FOR VARIOUS LEVELS OF WORKING CAPACITY

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 3, May-Jun 84 (manuscript received 16 Apr 82) pp 370-374

PETROV, Yu. A., State Institute of Physical Culture imeni P. F. Lesgaft, Leningrad

[abstract] A study is presented of the specifics of space-time relationships of cerebral biopotentials in the process of physical activity continued until the subject refuses further effort. Highly qualified sportsmen with various sports specialties were tested. Changes in cortical activity were studied by correlation and coherent analysis of EEG. The data obtained showed clear restructuring of the spectral composition of the EEG and coherence of cortical

potentials in the subjects at various times during the experiments. Increases in intercentral correlations and coherence were observed during the initial, middle and end periods of the studies. At the initial moments of development of fatigue, the number of high correlation coefficients of potentials was 1.8 times higher than in the acute stage. In persons not well adapted to the test bicycle ergometer load (noncyclists), there were higher levels of intercentral correlation and greater growth in distances of maximum coherence of EEG, particularly between precentral and prefrontal areas than in cyclists who were more accustomed to the type of exercise used. Figures 3; references 23: 19 Russian, 4 Western.
[795-6508]

UDC: 612.014.461.3

PULMONARY BLOOD FLOW AND OXYGENATION OF ARTERIAL BLOOD IN A HEALTHY SUBJECT UPON 7 DAYS HYPOKINESIA

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 3, May-Jun 84
(manuscript received 30 Dec 82) pp 421-425

NIKOLAYENKO, E. M., KATKOV, V. Ye., GVOZDEV, S. V., CHESTUKHIN, V. V. and VOLKOVA, M. I., Scientific Research Institute of Transplantology and Artificial Organs, USSR Ministry of Health, Moscow

[Abstract] A study is presented of the dynamics of change of oxygenation of arterial blood, as well as general and regional profusion of the lungs during 7 days antiorthostatic hypokinesia (15°). Thirty to 40 minutes after a healthy subject has moved from a horizontal position to the antiorthostatic position with a slope of -15°, a significant drop occurs in oxygenation of the arterial blood, progressing up to the third day. This drop in $Pa0_2$ results from an increase in the alveolo-arterial PO_2 gradient. The summary pulmonary blood flow at -15° remains practically unchanged, but is significantly redistributed. Blood flow significantly increases in the zones in the lungs receiving air from the dead space. It is decreased in zones receiving fresh gas, thus decreasing ventilation effectiveness and causing an increase in alveolar ventilation. Arterial hypoxemia results from displacement of the log-normal distribution of the ventilation-profusion relationships both in the direction of lower and in the direction of higher values, which cannot be explained by the gravitational factor alone. Figures 2; references 20: 10 Russian, 10 Western.
[795-6508]

UDC: 612.82

SPECIFICS OF DYNAMICS OF BRAIN BIOPOTENTIALS UNDER THE INFLUENCE OF COMPLEX AUDIBLE COMMUNICATIVE SIGNALS

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 10, No 3, May-Jun 84 (manuscript received 28 Mar 83) pp 469-471

NOVITSKAYA, L. P., Belorussian State University imeni V. I. Lenin, Minsk

[Abstract] The purpose of this work was to study the specifics in the dynamics of the functional status of the brain under the influence of complex communicative audio signals based on spatial relationships of summary EEG energy and data on local and diffuse changes in its interhemispheric distribution. Studies were performed on 22 practically healthy persons 18 to 26 years of age involving monopolar recording of EEG within an 8 channel electroencephalograph. The correlation coefficient was calculated by the Breinstein equation to estimate spatial relationships of bioelectric activity. Local and diffuse changes in spatial distribution of the integral summary EEG energy were estimated by calculating the per cent relationship of absolute values of these indicators during the second 30 seconds of each minute. Classical music increased the probability of appearance of significant positive correlation coefficients between the temporal areas of the two hemispheres and between the central and temporal areas of the right hemisphere. Rock and disco music decreased the probability of significant positive correlation coefficients. Statistically reliable data are produced indicating different nature of the space-time changes in bioelectric activity of the brain as a function of the type of signal received. References 6: 4 Russian, 2 Western. [795-6508]

UDC: 613.646:[612.014.43:612.015.3

BIOCHEMICAL EVALUATION OF BODILY INFLUENCE OF HIGH AND LOW TEMPERATURES

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 3, Mar 84 (manuscript received 19 Sep 83) pp 31-34

BARKALAYA, A. I., VERKHOTIN, M. A., Institute of Biophysics, Moscow

[Abstract] Fourteen observations of volunteers were conducted in a climate chamber at 30 to 100°C, relative humidity 75%. At temperatures over 50°C, a suit with a water tube cooling system was used. The test subjects performed physical work at a moderate rate in all cases. At high air temperatures, air was supplied for breathing through a hose from outside the chamber. Six low temperature observations were performed in water at 4-5°C, with some of the volunteers in a wet suit, all with heat supplied. Blood lactate

dehydrogenase activity was studied. High temperatures increased activity and caused skeletal muscle and myocardial hypoxia. Cooling raised LDH activity only a little bit, actually decreased LDH activity in skeletal muscles. This opens a possibility for indirect recording of the reaction of dissociation of oxidative phosphorylation and thus the degree of adaptive muscle thermogenasis. References: 5 Russian.
[1608-6508]

WORKING CONDITIONS FOR WOMEN

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 8, Aug 84

[Article by V.N.Artemyev and V.L.Mol'kova: "Further Improvements in Women's Working Conditions"]

[Text] As decreed by the secretariat of the All-Union Central Council of Trade Unions (VTsSPS), an All-Union scientific and practical conference dedicated to "The further improvement of women's working conditions in light of the decisions adopted by the 26th Congress of the CPSU" was held in Ivanovo on April 6-7, 1983. Six hundred people took part in the deliberations, among them noted scientists, leaders and high-ranking officials of ministries, departments, industrial associations and enterprises, representatives of party, soviet and trade union organizations.

A report entitled "The elevation of the role of women in the labor and socio-political processes in light of the decisions adopted by the 26th Congress of the CPSU" was presented by the chairwoman of the Ivanovo oblast council of trade unions M.G.Soldatikova. Technological progress and methods to improve the working conditions of women employed by enterprises of the USSR Ministry of Light Industry were the subject of a report by the chief of that ministry's labor safety department V.V.Aleksandrov. This problem is being resolved in the light industry sector primarily through the technical renovation and reconstruction of existing enterprises, comprehensive mechanization and automation of production and the introduction of new equipment.

A joint report presented by the director of the Labor Hygiene and Occupational Diseases Institute of the USSR Academy of Medical Sciences N.F.Izmerov and laboratory head Z.A.Volkova touched on the results and objectives of scientific research into the labor hygiene of women and noted that in the current five-year plan period hygienists and obstetricians-gynecologists are concentrating their efforts on implementing the tasks set by the 26th Congress of the CPSU in the matter of improving the labor and living conditions of working women.

The director of the Labor Safety for Women VNII of the VTsSPS in Ivanovo V.M.Zakharov spoke about achievements and primary objectives in the field of women's labor safety regulations. This institute conducts research in enterprises and industries where women comprise the majority of the workforce, such as the textile, light, food, construction materials, chemo-pharmaceutical and so on. A report by L.L.Rybakovskiy, a department head with the Sociological Research Institute of the USSR Academy of Sciences on "The character of demographic development in the USSR and workforce-related problems in the 1980s" was received with deep interest.

In all, 44 reports and communications were presented at plenary and section meetings.

Three sections were organized at the conference. Many of the reports presented to the section "The socio-economic aspects of female labor in light of the decisions adopted by the 26th Congress of the CPSU" underlined the fact that scientific and technological progress has fundamentally altered the professional and qualificational makeup of female work, the proportion between the manual and the mechanized, the physical and the intellectual work that women perform. Also discussed were questions relating to the effectiveness of female labor and various ways of raising that effectiveness, the influence of scientific and technological progress on female labor, the social problems of female labor in a developed socialist society, the role of trade unions in improving the labor and living conditions of working women, ways of heightening their socio-political activity and others.

Discussed by the section "Technological progress and ways of further improving working conditions for women in the USSR" were such problems as the specific character of scientific and technological progress in industries with a largely female workforce, improving the safety of industrial equipment operated by women and the quality of their work clothing, ways of bettering working conditions in agriculture, the retail trade, postal services, the automobile, electrotechnical, construction materials and a number of other industries.

The section "Technological progress and the medico-biological aspects of female labor" devoted its deliberations to the achievements and tasks of scientific research into the improvement of working conditions for women, citing ways of reducing the sick rate among them and recommending various health measures.

The report presented by director of the Kiev Labor Hygiene and Occupational Diseases Institute Yu.I.Kundiyev and coauthors was devoted to achievements and prospects in the matter of improving the working conditions, quality of life and medical care of women engaged in agriculture. The report noted that thanks to the systematic implementation of state socio-medical measures the health of

women agricultural workers has improved significantly. However, yet to be researched is the labor hygiene of women employed in a number of little-studied sectors of agriculture such as fur farming, apiculture and rabbit breeding.

The influence of working conditions on the health of women and their progeny was the subject of a report by the director of the Sverdlovsk Maternity and Child Protection Institute R.A.Malysheva and coauthors and a communication by the director of the Ivanovo Mother and Child Institute V.N.Gorodkov.

Department chairwoman N.Yu.Tarasenko and docent A.I.Mironov, both of the First Moscow Medical Institute imeni I.M.Sechenov, presented a report recommending measures to provide a healthier environment for women in light industry. The subject of a report by the director of the Ivanovo Medical Institute B.S.Lopatin was the optimization of labor conditions and the reduction of the sick rate for women working in the textile industry.

The Hygiene of Water Transport Institute of the USSR Ministry of Health conducted a study of the medical and sanitary care provided to female workers in the water transport industry and drew up a list of all legislation concerning women's labor safety and health. These materials were featured in a report by the director of the institute Yu.M.Sten'ko and senior research worker A.S.Poroshenko.

Presented and discussed were reports dealing with the improvement of labor conditions and medical care for women working in the petroleum processing, construction materials and antibiotics industries, in railroad transport and others.

N.S.Smirnova, a physician representing the Yaroslavl Oblast Council of Trade unions, informed her listeners about the organization of medical care for women employed by the Yaroslavl Motor Works.

The participants of the conference drew up a number of recommendations to ministries and departments, enterprises and organizations, trade union central committees and regional councils. Underlined was the need to activate comprehensive mechanization and automation of production, transport, loading, unloading and auxiliary operations. Technological processes and equipment must be made fully compatible with the ergonomics, labor hygiene and physiology of women, ruling out the possibility of dangerous and harmful industrial factors exerting a negative influence on the health of women and through the mother's organism on their progeny.

12258
CSO: 1840/1628

'KASMON' COMPUTERIZED SYSTEM FOR MASS MEDICAL EXAMINATIONS

Moscow MEDITSINSKAYA GAZETA in Russian 31 Aug 84 p 2

[KANEP, V., Member, USSR Academy of Medical Sciences, Latvian Minister of Health]

[Abstract] This lengthy article reports on a comprehensive computerized system called KASMON which has been developed for the purpose of conducting mass medical examinations of the Latvian republic's population. The procedure for examinations by the KASMON system is briefly described. Patients first complete a questionnaire containing several dozen questions. They then undergo laboratory examinations and chest x-rays. Each patient's arterial and intraocular pressures are measured, and an electrocardiogram is made. The patient's answers from the questionnaire and data from his physical examination are fed into a computer. If necessary, the computer immediately issues instructions to an appropriate specialist, listing all of the symptoms of illness and deviations from norms which have been detected. It takes a little over an hour to examine one person with the aid of the computer.

FTD/SNAP
CSO: 1840/864

UDC: 616.98:578.832.1]-084.4:312.2

INFLUENCE OF COMBINED CITY-WIDE INFLUENZA CONTROL SYSTEM ON MORTALITY

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian, No 2, Feb 84 (manuscript received 7 Feb 83) pp 55-58

GAGARINOVA, V. M. and ZHUKOV, A. O., All-Union Scientific Research Institute of Influenza, USSR Ministry of Public Health, Leningrad

[Abstract] A combined differentiated influenza control system was introduced in one city in the USSR in 1976-1980, including a combination of prophylactic and antiepidemic measures using live inactivated vaccines, remantadin and other antiinfluenza medications. The measures were performed to varying degrees depending on the social and age group of the population, condition of health and epidemic situation. Children, old persons and the nonworking population were inoculated first, a total of 70% of the population of the city being inoculated in all. When an epidemic began, early treatment of the influenza was begun broadly among old persons with remantadin, among children with symptomatic and pathogenic medications on the first or second day of the disease. This work utilized data from the official statistics of mortality of the population of 2 closely located cities, number one the city in which the influenza measures were taken, number two being a control. It was found that cardiovascular disease and diseases of the organs of respiration were most significant among causes of death in both cities. The combination of prophylactic and antiepidemic measures was found to have a positive influence on mortality. Use of the combined system of influenza control reduced mortality from influenza and upper respiratory disease. Among children in the first year of life a tendency was observed toward decreased mortality resulting from influenza, upper respiratory disease and pneumonia. References: 7 Russian.
[1524-6508]

UDC: 616-056.266-057-08-036.868(470.23-25)

OCCUPATIONAL DISEASE MORBIDITY AMONG LENINGRAD INDUSTRIAL WORKERS AND PROBLEMS OF REHABILITATION

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 3, Mar 84 (manuscript received 12 Oct 83) pp 19-22

FRADKINA, V. I., KLEVTSOV, V. I., YURKEVICH, A. Ya. and NAZAROVA, L. S., City Medical Consultation Committee on Occupational Diseases, Leningrad Institute of Labor Hygiene and Occupational Diseases; Institute of Consultation and Organization of Invalids

[Abstract] The authors analyzed data on occupational morbidity in Leningrad, the dynamics of first invalidism, and traced the occupational history of all patients declared invalids by the City Medical Consultation Commission in 1977-1978 for a period of four to five years. Analysis showed that diseases of the hands resulting from functional overstress were the leading cause of invalidism, followed by vibration disease and dermatosis, with only a few cases of pneumoconiosis, chronic poisoning and auditory neurosis. Many patients with occupational diseases were banned from further contact with harmful factors. Problems with retraining and requalification of workers who may have little education and be almost at retirement age when occupational disease develops are discussed. References: 7 Russian.
[1608-6508]

BRIEF

AMBULANCE FALSE ALARMS--On 22 March, we published an item in our paper about false alarms for ambulance requests, indicating what damage this does to the cause of protecting the health of the public. We also discussed the fact that one of the people who perpetrated such a call, Flyazhenkov, was punished by a comradely court [semi-official body]. This item inspired quite a bit of mail from readers. The authors of the letters to the editor are unanimous in the belief that punishment should be mandatory for such misdemeanors and the punishment should be stricter than for the lift-truck driver of the First Print Shop of the Komsomol, A. Flyazhenkov. On 10 June we published the official response to our item, signed by B. M. Van'kovich, deputy procurator of the city, senior judicial counselor. It stated that "with regard to citizen A. P. Flyazhenkov, the procurator's office of Volgogradskiy Rayon has initiated a criminal case for the crime of malicious mischief for the false call to the emergency brigade." Now we can report to readers that the A. P. Flyazhenkov case has been examined by the people's court of Volgogradskiy Rayon, and by sentence of this court on 13 July 1984 Flyazhenkov will be deprived of his freedom for 2 years, with mandatory participation in labor. We hope that this is a good warning for "telephone pranksters." [Text] [Moscow MOSKOVSKAYA PRAVDA in Russian 17 Aug 84 p 2] 10,657

UDC 577.391:612.015.33:612.419

FORMATION AND REPAIR OF DNA BREAKS IN IRRADIATED RAT BONE MARROW CELLS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 17 Dec 82) pp 296-299

TRONOV, V. A., PROVOTOROV, A. V., RAD'KO, S. P, and SHAGALOV, L. B.,
Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] The dynamics of DNA break repairs in bone marrow cells (BMC) of white randomly bred rats was studied after exposure to x-rays by the sedimentation method. The ability of BMC to repair single strain breaks due to x-ray damage, observed in earlier studies, was confirmed, this process being independent of the temperature in the range of 25-37°C. During postradiational incubation of cells at 25°C a rapid separation of single strain was noted, reaching 60-70% within 1.5-2 hours. It could be assumed that along with repair, endonuclease degradation of DNA occurred in the dying cells, contributing to the unrepaired status. The double strand breaks which are hard to repair, could be the reason for above observation, but this possibility was not supported by experimental data obtained. The more plausible reason for limited cell repair of BMC in short term culture could be related to the presence of cells in bone marrow differing in their proliferative activity: actively proliferating stem cells, maturing cells with limited ability to divide and differentiated, nondividing elements in which DNA repair is very limited. Hence at each dose of irradiation, without affecting their relationship, a certain number of unrepaired cells would be present.
Figures 2; references 26: 6 Russian, 20 Western.
[1547-7813]

UDC 577.391

PARTICIPATION OF CYCLIC NUCLEOTIDES IN REALIZATION OF CERULOPLASMIN EFFECT

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 21 Apr 83) pp 334-336

ANTONENKO, S. G., BERDINSKIKH, N. K. and CHEBOTAREV, Ye. Ye.,
Institute of Oncological Problems imeni R. Ye. Kavetskiy, UkSSR Academy of Sciences, Kiev

[Abstract] Formation of free radicals and peroxides is an early sign of radiation pathology leading to complex changes in an organism. Ionizing radiation affects many enzymes including the copper containing oxidase--ceruloplasmin--and intracellular regulatory system of cyclic nucleotides participating in hormonal and physiological actions. An assumption was made that radioprotective action of cerulopalsmin is achieved through the system of cyclic nucleotides. The experiments were done on white male rats exposed to 4.22, 5.28 and 7.20 Gy dose of x-rays. A single intraperitoneal injection of human ceruloplasmin one hour prior to irradiation led to an increased content of c-AMP and c-GMP in the thymus and spleen of the experimental rats 3 and 6 hours post-exposure. Most probably, increasing the ratio of cAMP/cGMP in radiosensitive organs, ceruloplasmin intensifies their radioresistance. Figures 1; references 9: 7 Russian, 2 Western.
[1547-7813]

UDC 577.391;547.963.3;546.212.02

COMPARISON OF STRUCTURE AND CATABOLISM OF RAT THYMUS DNA DURING ACTION OF EQUIVALENT DOSES OF TRITIUM OXIDE AND γ-RADIATION

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 18 Feb 83) pp 344-347

RUSINOVA, G. G., TURDAKOVA, V. A., SHOROKHOVA, V. B. and MUSHKACHEVA, G. S.,
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[Abstract] Effect of tritium oxide on the content, structure and some metabolic aspects of DNA were studied on three groups of Wistar rats. The first group received a single oral dose of tritium oxide 22 mBq/g of body weight (a cumulative dose of 7.8 Gy); the second group was irradiated 18 hrs per day for 30 days with ^{137}Cs γ-quanta aiming at reaching a dose similar to that of the first group; the third group served as control. Most pronounced changes were observed during the 14-30 days period and they consisted of: a decrease in DNA concentration and lower molecular mass of single stranded DNA, an increase in PDN content and an activation of acid DNAases in the thymus. In general tritium exhibited a more pronounced effect on the thymus than γ-quanta during the period of dose accretion. This could

lead to higher yield of tumors and shorter survival. This effect of tritium was due to higher LET and somewhat nonuniform distribution of tritium in tissues with different content of water. Figures 1; references: 10 Russian. [1547-7813]

UDC 577.391;547.963.3;591.81

DOUBLE STRAND DNA BREAKS AND MAMMALIAN CELL INACTIVATION IN RELATIONSHIP TO RADIATION LET--COMPARISON BETWEEN EXPERIMENTS AND THEORY

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 15 Dec 82) pp 300-304

ABEL', Kh., ERZGRAEBER, G., EICHORN, K.*, KAMPF, G.* and TOLKENDORF, E.*, Joint Institute of Nuclear Research, Dubna; *Central Institute of Molecular Biology, GDR Academy of Sciences, Berlin-Buch

[Abstract] Theoretical concepts of radiation inactivation of mammalian cells proposed by Guenther and Schulz were tested experimentally, determining the relationship of Chinese hamster cell survival and the magnitude of double strand DNA breaks to the exposure dose of x-rays, deuterons, α-particles and ^{12}C ions. Analysis of the experimental data showed that the semiempirical theory of Guenther and Schulz makes it possible to forecast the survival curves of the cells exposed to different LET radiation. Evidently, the cell division inactivation is determined only by measurable double strand DNA breaks. Figures 4; references: 6 Western.
[1547-7813]

UDC 577.391;591.81;591.813

PROLIFERATIVE ACTIVITY AND ABERRATION FREQUENCY OF CHROMOSOMES DURING FIRST MITOSIS IN 50-, 60- AND 70-HOUR CULTURES OF IRRADIATED AND NONIRRADIATED CELLS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 14 Apr 83) pp 310-314

PYATKIN, Ye. K., NUGIS, V. Yu. and POKROVSKAYA, V. N., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] Two problems were investigated in this study: 1) comparison of proliferative activity and chromosome aberration frequency during first mitosis in 50-, 60- and 70-hour human periferal blood lymphocyte cultures after in-vitro irradiation with 6 and 8 Gy doses in mixed cultures of irradiated and nonirradiated cells analogous by their fixation periods and 2) evaluation of the effect of radiation induced proliferation delay on chromosome damage frequency in irradiated lymphocyte cultures and again in mixed

cultures of irradiated and nonirradiated cells analogous by their fixation periods and 2) evaluation of the effect of radiation induced proliferation delay on chromosome damage frequency in irradiated lymphocyte cultures and again in mixed cultures of irradiated and nonirradiated cells. Preliminary results were already published earlier. Present data showed that nonirradiated lymphocytes enter first mitosis earlier than the irradiated ones; this occurs in cells with single aberrations of chromosomes earlier than with multiple aberrations. This modified effect of lymphocyte proliferation delay on chromosome aberration yield must be taken in consideration during radiation-cytogenetic experiments suing stimulated human FGA lymphocytes and in estimation of the dose by the number of damaged chromosomes in accidentally irradiated individuals. Figures 2; references 10: 3 Russian, 7 Western. [1547-7813]

UDC 577.391.612.014.43.612.419

RADIOSENSITIZING AND CYTOTOXIC ACTION OF HYPERTHERMIA ON VARIOUS BIOLOGICAL SYSTEMS. RADIOSENSITIZING AND CYTOTOXIC EFFECT OF HYPERTHERMIA IN HEMOPOIETIC STEM CELLS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 25 May 83) pp 325-329

KONOPLYANNIKOV, A. G., KONOPLYANNIKOVA, O. A., TRISHKINA, A. I. and SHTEYN, L. V., Scientific Research Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk

[Abstract] Radiosensitizing and cytotoxic action of hyperthermia on murine leucosis cells was reported in earlier studies; presently analogous data were sought on normal hemopietic cells. Studies were carried out on (CBAxC57Bl/6)F_1 hybrid male mice. Heat inactivation of CFU's has been described in the temperature range 41-44°C. Hyperthermia performed 1 hr prior to irradiation showed a distinct radiosensitizing effect. Heating 1 hour after irradiation had no sensitizing effect on CFU's. The cytotoxic and radiosensitizing effects of hyperthermia on hemopoietic stem cells were characterized. The CFU's were more thermosensitive than the murine leucosis La cells, a fact which could possibly be used to eliminate tumor cells from patients bone marrow. Figures 3; references 10: 3 Russian, 7 Western. [1547-7813]

UDC 577.391.612.11/12.611.41.547.466

CHANGE IN METABOLIC POOL OF FREE AMINO ACIDS IN PERIPHERAL BLOOD AND SPLEEN AFTER WHOLE BODY UNIFORM γ-IRRADIATION

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 20 Feb 83) pp 330-333

KONNOVA, L. A. and KOMAR, V. Ye., Central Scientific Research Roentgen-Radiological Institute, USSR Ministry of Health, Leningrad

[Abstract] Composition of free aminoacids in erythrocytes, plasma, whole blood and spleen of white male rats was studied after exposure to whole body uniform γ-radiation with 3, 6, and 12 Gy doses along with analysis of the aminoacids ratio of erythrocytes/plasma prior to and during 3 days after exposure to the irradiation. The experiments showed that the changes in metabolic pool of aminoacids in blood and spleen reflected the gravity of the pathogenic processes caused by the ionizing radiation. A lowering of the index of aminoacid levels one day after the irradiation along with increased plasma level of tryptophan was indicative of serious degree of radiation damage. Figures 4; references 7: 5 Russian, 2 Western. [1547-7813]

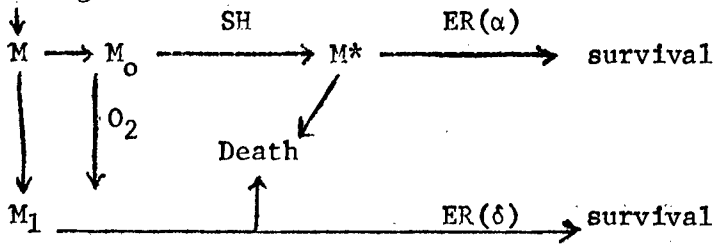
UDC 577.391;616.018

GENERAL SCHEME OF MODIFICATION OF REPRODUCTIVE CELL DEATH

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 15 Jul 83) pp 337-340

EYDUS, L. Kh. and KORYSTOV, Yu. N., Institute of Biological Chemistry, USSR Academy of Sciences, Pushchino

[Abstract] A general scheme for reproductive cell death modification was described and data were analyzed indicating its general applicability in respect to the action of various modifying agents: radioprotectors (thiols and indolylalkylamines), electron-accepting radiosensitizers, hyperthermia, hyperglycemia etc. The general scheme is as follows:



where M_o = O_2-dependent and M_1 = O_2 independent injury
M* = enzyme reparable injury, and ER = probability of enzyme repair: α = of M*; δ of M_1 injuries.

At the first stage oxygen competes with thiols, therefore radiosensitivity may be modified changing concentration of either components by a number of agents: thiols, indolylalkylamines, oxygen, substances affecting O_2 consumption by the cell, etc. At the second stage modification may be achieved by inhibition (repair inhibition, hyperthermia) or intensification of enzymic repair processes (nonspecific reaction, "biochemical shock" or delay of mitosis). Figures 1; references 17: 11 Russian, 6 Western.
[1547-7813]

UDC 577.391;591.82.11

CHANGES IN ABSORPTION CAPACITY OF RETICULOENDOTHELIAL SYSTEM DURING COMBINED RADIATION-THERMAL INJURY

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 26 Mar 83) pp 383-385

BUDAGOV, R. S. and BUDAGOVA, Z. K., Scientific Research Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk

[Abstract] Nonspecific changes in the protective functions of the reticuloendothelial system (RES) appearing in various traumas, burns and radiation injuries were used as a basis for the experimental evaluation of the mechanism of syndrome aggravation during concurrent exposure to ionizing radiation and burn trauma. Experiments were done on immature male Wistar rats. After exposure to a 7.5 Gy dose of ^{60}Co rays, 15% of the back surface of animals was burned. The results showed that these pathogenic processes had a cumulative effect on RES. The ability of tissue macrophages to remove inert colloids from the blood was depressed significantly, probably as a result of intravascular hemolysis of erythrocytes and their blocking the RES. During the combined action of radiation and burn trauma, the resistance of animals to autoinfection and endotoxemia was lowered much more in cases of individual exposures. Figures 1; references 10: 3 Russian, 7 Western.
[1547-7813]

UDC 577.391

RADIATION INDUCED CHANGES IN CRITICAL ORGANS OF PARABIOTICALLY JOINED RATS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 10 Mar 83) pp 400-403

TIMOSHENKO, S. I., BOGATYREV, A. V., NIKANOROVA, N. G., PUSHKAREVA, T. V. and KALMYKOVA, G. I., Leningrad Institute of Nuclear Physics imeni B. P. Konstantinov USSR Academy of Sciences

[Abstract] Intestinal and hemopoietic organs were studied in parabiotic rats, one of which was exposed to superlethal doses of radiation, while the other was totally shielded. One of the parabiotically joined rats received 8-16 Gy radiation 5-7 days after the surgery; control consisted of intact single rats and of nonirradiated parabionts. The results obtained showed that the presence of a nonirradiated partner aided in the recovery processes of the intestinal and hemopoietic organs. Increased survival of parabionts exposed to superlethal radiation was due to the fact that blood forming elements from the nonirradiated partner entered freely the irradiated organism leading to a rapid reestablishment of the cellular composition of hemopoietic system in the irradiated parabiont. The influx of functional blood forming cells had a stimulating effect on gastrointestinal tract and intensified the resistance of the irradiated animal to bacterial infections. Figures 2; references 9: 6 Russian, 3 Western.
[1547-7813]

UDC 577.391:002.704.31

REPORT OF III ALL-UNION WORKSHOP ON RADIOBIOLOGY "MECHANISMS OF RADIATION DAMAGE AND THEIR MODIFICATIONS", PERM, SEP-OCT 83

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84 pp 417-418

KUDRYASHOV, Yu. B. and IZMOZHEROV, N. A.

[Abstract] The III All Union Workshop on radiobiology for new investigators, university instructors and research specialists of the USSR Ministry of Higher Education was held 28 Sep-10 Oct 83 in Perm. It was organized by the USSR Academy of Sciences Scientific Council on the Problems of Radiobiology, Moscow and Perm University as well as by the Perm Division of the All Union Medical Technological Society based on the Radiobiology Laboratory for Natural Science Institute at the Perm University and with collaboration of Moscow Society of Nature Researchers. The course included 25 review lectures, 3 general discussions, 3 rapporteur presentations and 25 poster sessions. A series of round table discussions was held. The following topics were covered: 1) mechanism of radiation damage: biomacromolecules, subcellular structures, cells, regulatory systems of the organisms, population genetics; and 2) modification mechanisms of radiation damage: modification

of regulatory systems, radiosensitivity and radioprotection. The proceedings were summarized by Yu. B. Kudryashov.
[1547-7813]

UDC 577.391;612.111.7

QUANTITATIVE EVALUATION OF RADIATION DAMAGE OF THROMBOCYTOPOIESIS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 10 Feb 83) pp 355-359

SELIVANOV, V. A. and TYAZHELOVA, V. G., Institute of Biological Physics, USSR Academy of Sciences, Pushchino

[Abstract] On the basis of past studies a mathematical model of thrombocytopoiesis was developed. Three cell populations were identified: proliferating cells--predecessors of megacaryocytes; maturing cells--megacaryocytes, and functional cells--thrombocytes. The rate of the transit of these cells to each of the following population and the rate of the death of thrombocytes was proportional to their number in a given population and inversely proportional to average transit time. The model was shown to represent accurately the kinetics of thrombocytes after experimental variation of their number by means of transfusion. Modelling of postradiational kinetics of thrombocytes, megacaryocytes and their predecessors in rats and mice exposed to various single radiation doses helped in determining the fate of cells killed in the interphase, the duration of mitosis delay, duration of the abortive rise, the time which the cells spent in proliferating, maturing and functional pools and the relationship of these values to the radiation dose. The results obtained were tabulated. Model analysis showed that the transit time for megacaryocytes immediately after irradiation decreased 1.3 to 1.5 fold regardless of the dose. The transit time of committed megacaryocyte precursors was reduced due to the death of premature precursors and survival of mature forms. Figures 2; references 14: 7 Russian, 7 Western.
[1547-7813]

UDC 577.391;615.739.16

POSTRADIATION DISORDERS OF ADENINE-PHOSPHORIBOSYLTRANSFERASE PATHWAY OF AMP BIOSYNTHESIS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 14 Apr 83) pp 347-350

KUZNETSOVA, Ye. V., KOSHCHEYENKO, N. N. and ROMANTSEV, Ye. F., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] Adenine-phosphoribosyltransferase (EC 2.4.2.7) catalyzes the biosynthesis of adenosinemonophosphoric acid (AMP) from adenine and 5-phospho-α-D-riboso-1-diphosphate (PPDP). Using this pathway adenine can be reutilized after it has formed in the breakdown of endogenous and exogenous adenyl nucleotides and nucleic acids. Activity of EC 2.4.2.7 was measured in thymus and in liver extracts of male mice (CBAxC57B1)F_1 exposed to a single radiation dose of 245.1 mC/kg. The level of EC 2.4.2.7 in liver remained unchanged for the first 24 hours of observation. In thymus, 3 hrs after exposure, the activity of this enzyme dropped to 70-80% of the control values, returned to normal around 6 hrs post-exposure and then increased to 150-160% of the control values at about the 24th hour. The lowering of EC 2.4.2.7 activity could be due to a decreased number of functional molecules of the enzyme. Between 3 and 6 hours after the exposure to radiation, a massive lymphoid cell kill takes place. Towards the end of the first day, the increased activity may be explained by localization of this enzyme in reticuloendothelial cells and not in the lymphocytes. References 19: 11 Russian, 8 Western.
[1547-7813]

UDC 577.391;615.771.8

ROLE OF SEROTONIN'S HYDROXYL GROUP IN ITS PHARMACOLOGIC AND RADIOPROTECTIVE EFFECT

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 10 Feb 83) pp 411-414

VASIN, M. V., ANTIPOV, V. V., SUVOROV, N. N., ABRAMOV, M. M. and GORELOVA, N. V.

[Abstract] The role of the hydroxyl group of serotonin(I) was evaluated in its pharmacologic effect using O-hydroxylalkyl derivatives of I as a model. Experiments were carried out on randomly bred femalesmice exposed to 9 Gy ^{60}Co quanta. The data obtained showed that ω-hydroxylation of O-alkyl-I improved slightly its radioprotective and pharmacological properties. The unfavorable action of 5-O-alkylation of serotonin was not reversed, however. Biological effects of a number of alkyl chains between the 5 position of the indole ring and the hydroxyl group were discussed showing a relationship between the ratioprotective effect and their action on blood supply to the spleen. Introduction of alkoxy or tert-amino groups into ω-position removed the radioprotective effect of 5-alkoxytryptamines. Figures 1; references 18: 8 Russian, 10 Western.
[1547-7813]

UDC 577.391;591.444

THYROID HYPOFUNCTION DURING ISOLATED AND COMBINED RADIATION-THERMAL INJURIES

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 29 Mar 83) pp 390-394

CHUREYEVA, L. N., BUDAGOV, R. S. and ZAYCHIK, V. Ye., Scientific Research Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk

[Abstract] Using trauma models differing in their prognosis on life expectancy, an attempt was made to find possible correlation between thyroxin deficit in blood and morphofunctional state of the gland. Experiments were done on male Wistar rats subjected to 7.5 Gy radiation and 15% of body surface burn. Analysis of the totality of morphologic, morphometric and histochemical results led to a conclusion that the cellular-tissue substrate assuring the synthesis of thyroid hormones is not significantly affected. The significant drop in thyroxin concentration in blood could not be explained by any effect on the central regulation of thyroid gland functions. Several possible causes were suggested but none could fit all the observations made in these experiments. Figures 1; references 16: 8 Russian, 8 Western.
[1547-7813]

UDC 577.391;539.163;576.5

EFFECTIVENESS OF ^{239}Pu REMOVAL BY LIPOSOME ENCAPSULATED PENTACIN

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 10 Apr 83) pp 386-388

SMIRNOV, A. A., ALTUKHOVA, G. A., BELYAYEV, I. K., IVANNIKOV, A. T. and IL'IN, L. A., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] The problem of removal of radionuclides from the cells has not been solved to this time. The goal of this work was to study the patterns of the removal of polymeric ^{239}Pu and its colloidal hydroxides from the organism by means of pentacin encapsulation in liposomes (LP). A single administration of LP decreased the level of citrate complex of polymeric ^{239}Pu to 85% of the control levels; nonencapsulated (free) pentacin (FP) reduced it only to 97%. After four courses with LP and FP these values dropped to 66 and 86% respectively. Neither LP nor FP therapy was effective in lowering the level of colloidal hydroxides of ^{239}Pu. The effectiveness of the removal of ^{239}Pu from the cells depends on physical-chemical state of the radionuclide and its interaction with the substrate and not on the quantity of LP entering the cell. Figures 1; references 11: 4 Russian, 7 Western.
[1547-7813]

UDC 577.391;615.771.8;611.3

INVESTIGATION OF ABSORPTIVE ACTIVITY OF GASTROINTESTINAL TRACT IN IRRADIATED ANIMALS UNDER RADIOPROTECTIVE CONDITIONS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 20 Apr 83) pp 408-410

CHIGAREVA, N. G. and TESLENKO, V. M., Military Medical Academy imeni S. M. Kirov, Leningrad

[Abstract] Absorptive capability of gastrointestinal tract (GIT) was studied in mice and dogs exposed to various doses of gamma-quanta, and in animals with prophylactic injections of radioprotective agents (cystamine, S-2(3-aminopropylamino)ethylthiophosphate--APAETP, and paraaminopropiophenone--PAPP). The results showed that abosrptive capability in mice dropped as early as 3 hrs after exposure. In dogs, significant changes in the absorptive capability of GIT was observed after 24 hrs. Prophylactic application of radioprotectors showed a beneficial effect on the function of GIT, probably as a result of their effect on the evacuative function of the system. Figures 1; references: 4 Russian.
[1547-7813]

UDC 577.391.612.419.611.36

DYNAMICS OF NUCLEIC ACID METABOLISM IN RAT BONEMARROW AND IN LIVER DURING COMBINED ACTION OF EXTERNAL γ-RADIATION AND PLUTONIUM-239

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 21 Sep 82) pp 370-373

YELKINA, N. I., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] The effect of concurrent exposure to γ-radiation and to plutonium-239 on themmetabolism of nucleic acids in two organs with different radiosensitivity--the bone marrow and liver--was studied on Wistar rats. The doses were as follows: γ-radiation--103.2 mC/kg and Pu-239--92.5 kBq/kg of body weight. In bone marrow the combined radioactivity led to a decrease of total caryocytes and altered metabolism of nucleic acids; liver, in contrast to the highly radiosensitive tissues, showed minor changes in these study parameters. The data obtained showed that the early changes in bone marrow and in other radiosensitive tissues were caused by γ-radiation; at later stages, as the absorbed dose increased, the overall effect was evidently caused by the incorporated plutonium. Figures 2; references 5: 4 Russian, 1 Western.
[1547-7813]

UDC 577.391:001.572

MODELLING OF CELL RECOVERY PROCESSES FROM RADIATION DAMAGE AND PRINCIPLE OF EFFECTIVE DOSE REDUCTION. MODEL OF POSTRADIATION RECOVERY WITH A FINITE NUMBER OF RECOVERY CHANNELS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 30 Aug 83) pp 364-367

ANDREYEV, A. D., Institute of Hydrobiology, UkSSR Academy of Sciences, Kiev

[Abstract] In previous papers a mathematical model for cell recovery was developed based on the principle of effective dose reduction. In the present paper, the question of the number of recovery channels in a cell was evaluated in detail. The term "recovery channel" represented the totality of intracellular enzymic systems assuring recovery from radiation damage. Using this model, it was shown that in yeast cells Megri 139-B, the number of recovery channels was at least 10. The model could be useful in coordination of studies of the radiation damage repair of DNA molecules as well as in studies of postradiational recovery of irradiated cells. References 8: 4 Russian, 4 Western.
[1547-7813]

UDC 577.391;539.163;599.323.4

LIFE EXPECTANCY OF RATS EXPOSED TO COMBINED EFFECT OF EXTERNAL (^{137}Cs) AND INTERNAL (^{237}Np) RADIATION

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 18 Feb 83) pp 373-376

BULDAKOV, L. A. and KARPOVA, V. N., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] The goal of this work was to investigate the effect of combined radiation with internal α- and external γ-radiation on average life expectancy of male Wistar rats. The external radiation was applied from a ^{137}Cs source at a dose of 51.6 mC/kg; the internal radiation was achieved by intracheal administration of ^{237}Np (the polymeric nitrate form) in chronically effective amounts ranging from 0.2 to 188.0 kBq/kg. The experimental data showed that the effect was additive. The average life expectancy of rats was significantly shorter than that shown by the animals exposed to one irradiation.
Figures 1; references 6: 5 Russian, 1 Western.
[1547-7813]

UDC 577.391

CHARACTERISTICS OF HIGH AND ULTRAHIGH DOSE EFFECTS OF γ-RADIATION ON LYMPHOID TISSUE

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 4 Jun 81) pp 424-425

LAVROVA, G. A., Leningrad Institute of Nuclear Physics imeni B. P. Konstantinov USSR Academy of Sciences, Gatchina

[Abstract] Reactions of lymphoid tissue of Wistar rats to γ-radiation in doses of 6.8-588 Gy was studied showing that spleen exhibited a definite dose threshold of 9.8 Gy above which no more morphological changes took place. In contrast, the changes in thymus were different at different doses: 6.8 and 9.8 Gy dose led to a sharp organ depletion and death of thymocytes; with ultrahigh doses of 147 Gy and higher, the cytoarchitectonics and cellular density of the cortex were preserved. An assumption was made concerning two mechanisms of the lymphocyte death due to exposure to ultra-high doses. (Manuscript #1334-84, deposited in VINITI 7 Mar 84).
[1547-7813]

UDC 577.391:615.27:616-001.28

CHARACTERISTICS OF RADIOPROTECTIVE AND PHARMACOLOGICAL ACTION OF AMINOPROPYLAMINOETHYLTHIOPHOSPHATE

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 9 Aug 82) p 423

LIBIKOVA, N. I. and STREL'NIKOV, Yu. Ye., Military Medical Academy imeni S. M. Kirov, Leningrad

[Abstract] Comparative study of the radioprotective activity and of the toxicity of S-2(3-aminopropylamino)ethylthiophosphate (APAETP) and cystamine was carried out; their distribution in the organism and their effect on pharmacological and biological processes was studied: the levels of lactic and pyruvic acids were determined along with acid-base equilibrium, levels of desoxyribonucleotide in spleen and cyclic nucleotides in the tissue. In comparison to cystamine APAETP was shown to have some advantages: higher radioprotective effect, better drug tolerance by the animals leading to lower toxicity and fewer metabolic disorders when APAETP was used in radioprotective doses. Manuscript #394-84, deposited in VINITI 19 Jan 84.
[1547-7813]

UDC 577.391:661.879:591.463/489

HISTOPATHOLOGY OF EXPERIMENTAL ANIMAL GONADS DURING EXPOSURE TO TRANSURANIUM ELEMENTS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 29 Mar 82) p 422

LYAGINSKAYA, A. M., OVCHARENKO, Ye. P. and FOMINA, T. P., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] Gonadal histopathology was studied on 543 Wistar rats and 79 dogs. The rats were injected intravenously with ^{239}Pu-monomer citrate in doses of 148, 370, 740 and 1221 kBq/kg, ^{239}Pu-polymer nitrate in a dose of 370 kBq/kg, ^{237}Np oxalate in doses 111, 148 and 185 kBq/kg and ^{239}Pu monomer nitrate intratracheally in doses of 37, 74 and 185 kBq/kg. The dogs inhaled ^{239}Pu(polymer) and ^{241}Am (monomer). A relationship was discovered between the gonadal histopathology of experimental animals and the quantity of transuranium elements (TUE) absorbed in principal organs and in gonads. The ineffective dose of TUE was established along with the absorption of each dose. (Manuscript #388-84, deposited in VINITI 19 Jan 84).
[1547-7813]

UDC 577.391;615.375

ENHANCEMENT OF AGGLUTINATING CAPACITY OF RAT BLOOD SERUM AFTER TOTAL BODY IRRADIATION WITH SUPERLETHAL DOSES

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 27 Apr 82) pp 389-390

IVANOV, A. A., SMIRNOVA, O. V., ISICHENKO, I. B. and BOYKO, M. I., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] The ability to elevate the levels of normal and immune antibodies in an early stage after radiation was studied on male and female Wistar rats exposed to ^{137}Cs γ-quanta at a dose of 48 Gy. It was shown that irradiation at a superlethal dose led to a significant increase in the level of normal and immune antibodies 3-24 hrs post exposure. Immunization carried out 7 days prior to irradiation altered this effect; however, irradiation at an even later time (14 days after immunization) led again to increased levels of anitbodies. References 7: 5 Russian, 2 Western.
[1547-7813]

UDC 577.391

MATHEMATICAL MODEL OF $^{239}PuO_2$ DISTRIBUTION IN ANIMAL BODY

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 21 Sep 82) p 422

KHARUNZHIN, V. V., SUKHODOYEV, V. V. and FETISOVA, L. I., Institute of Biophysics USSR Ministry of Health, Moscow

[Abstract] The dynamics of $^{239}PuO_2$ aerosol distribution in dogs (particle size 0.065 μm) which inhaled these particles, was described by a semi-chamber mathematical model (chambers--respiratory organs, tracheobronchial lymphatic nodes, blood, liver, skeleton, kidneys and the GI tract). This model makes it possible to estimate absorption of plutonium radiation doses by various organs as well as the intensified clearance paths from the lungs and to calculate plutonium content in organs during chronic inhalation. Manuscript #389-84 deposited in AUISTI 19 Jan 84.
[1547-7813]

UDC 577.391:614.876

PROPHYLACTIC USE OF IRON PREPARATION FOR PROTECTION OF BONE TISSUE FROM PLUTONIUM AND STIMULATING ACTION OF PENTACIN ON THIS PROCESS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 8 Dec 82) pp 422-423

RYSHONIK, S. I., Leningrad Scientific Research Institute of Radiation Hygiene, RSFSR Ministry of Health

[Abstract] The work dealt with the study of prophylactic use of iron preparation for protection of bone tissue from plutonium. As a result of this prophylactic use, the level of plutonium absorbed by bone tissue was lowered three-fold in comparison to controls. However, under some conditions, the levels of Pt in liver increased by 30%. When iron was combined with DTPA, the levels of radionuclide in bone dropped even more and none accumulated in liver. Manuscript #391-84, deposited in VINITI 19 Jan 84.
[1547-7813]

UDC 577.39-

KINETICS OF LYMPHOCYTES DURING CONTINUOUS EXPOSURE OF RATS TO γ-RADIATION. COMMUNICATION 2. CHANGES IN CELLUARITY OF THYMUS, SPLEEN AND LYMPH GLANDS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 16 Nov 83) p 421

ZUKHBAYA, T. M., Institute of Medical-Biologic Problems, USSR Ministry of Health, Moscow

[Abstract] Quantitative patterns of the changes in cellularity of thymus, spleen and lymph glands were studied on rats during continuous γ-irradiation in the dose range 0.4-4 Gy/day. Dose and time functions were determined for depopulation of lymphoid organs. The injury mechanisms and reconstitution of lymphopoiesis during continuous ionizing radiation were discussed. Manuscript #348-84 deposited in VINITI 19 Jan 84.
[1547-7813]

UDC 577.391:577.352.3

EFFECT OF RADIOPROTECTORS AND RADIOSENSITIZERS ON LIPID PEROXIDATION IN IRRADIATED CELLS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 3, May-Jun 84
(manuscript received 31 Jul 81) p 424

POPOV, G. A., KONEV, V. V. and SEYLANOV, A. S., Scientific Research Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk

[Abstract] The study of lipid peroxidation (LP) in living cell membranes showed that radioprotectors serotonin, ionol, cystein and dithiotreitol arrested LP, while the radiosensitizers PCMB and N-ethylmaleimide intensified it both in control and in irradiated cells. Metronidazol showed no effect on LP. Manuscript #736-84 deposited in AUISTI 8 Feb 84.
[1547-7813]

UDC: 615.849.1.015.4:615.919:579.843.1

INFLUENCE OF GAMMA RADIATION ON IMMUNOBIOLOGIC AND IMMUNOCHEMICAL PROPERTIES OF CHOLERA EXOTOXIN. REPORT 1. CHANGE IN BIOLOGIC ACTIVITY OF UNPURIFIED CHOLERA EXOTOXIN UNDER INFLUENCE OF IONIZING RADIATION

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 84 (manuscript received 28 Apr 82) pp 47-51

NEDUGOVA, G. I., RUBTSOV, I. V. and SAMOYLENKO, I. I., Central Scientific Research Institute of Epidemiology, USSR Ministry of Health, Moscow

[Abstract] A study was performed of the influence of gamma radiation on the immunobiological and immunochemical properties of the cholera exotoxin (native and purified) to determine the possibility of its use to produce cholera anatoxin. Native cholera exotoxin, a microbe-free centrifugate, was used. Irradiation was performed on an EKU-50 gamma installation with a dose of 30 kGr/min or an "Issledovatel' 1" with a dose rate of 120 kGr/min. The gamma radiation source was ^{60}Co. The influence of radiation on preparations was evaluated by changes of a number of biological properties in the dose interval used: enterotoxicity, activity, permeability factor and toxicity. Gamma radiation was found to have a high inactivating effect on the exotoxin. Enterotoxicity dropped reliably, the activity of the permeability factor and toxicity for mice also decreased. Dry preparations of the toxin were more radiation resistant than liquid preparations. A sterilizing effect of radiation was achieved after a dose of 20 kGr for liquid preparations, 30 kGr for dry preparations. When irradiated preparations of unpurified toxin were stored under various temperature conditions for 6 months to 1 and 1/2 years, the toxic properties were not restored, the immunogentic properties did not change. Figures 1; references 16: 7 Russian, 9 Western.
[1524-6508]

UDC 615.2/.3:061.3(571.1/.5)

ALL-UNION SCIENTIFIC CONFERENCE 'PROBLEMS OF ASSIMILATING DRUG RESOURCES OF SIBERIA AND FAR EAST'

Moscow FARMATSIYA in Russian Vol 33, No 4, Jul-Aug 84
(manuscript received 22 Dec 83) p 89

[Excerpt from article by S. D. Ivanova and K. D. Sedova]

[Excerpt] The All-Union Scientific Conference "Problems of Assimilating the Drug Resources of Siberia and the Far East", organized by the USSR Ministry of Health Main Pharmaceutical Administration, the USSR Ministry of Health All-Union Scientific Research Institute of Pharmacy, the USSR Academy of Medical Sciences Siberian Department's Scientific Research Institute of Internal Medicine, the Pharmaceutical Administration of the Novosibirsk Oblispolkom and the All-Union Scientific Society of Pharmacists was held in Novosibirsk from 18-20 December, 1983.

Representatives from 45 scientific and practical organizations participated in the work of the conference. Sixteen reports were heard and discussed at the conference; the following questions were discussed in them: continued provision of drugs to the population, prospects for studying medicinal plants within the "FARMATSIYA" problem topic, measures for increasing production and the procurement of medicinal raw materials for public health and drug industry needs, problems of resource management in Siberia and the Far East, introduction of medicinal plants of Siberia as a means of their protection and reproduction, study and prospects for making use of the legacy of Tibetan medicine, chemical-pharmaceutical, chemical-engineering, biochemical and geochemical aspects of the study of medicinal plants, problems of the comprehensive use of medicinal plants and waste-free technology for obtaining medicinal compounds, study of the plants by Siberian and Far Eastern VUZ's and the role of plant preparations in the treatment and prevention of diseases. The "Medicinal Plants of Siberia and the Far East" regional program was discussed.

Among the speakers were O. A. Volkov, deputy chief of the USSR Ministry of Health Main Pharmaceutical Administration; N. R. Deryapa, chief scientific secretary of the USSR Academy of Medical Sciences Siberian Department and corresponding member of the USSR Academy of Medical Sciences;

Professor A. I. Tentsova, director of the All-Union Pharmaceuticals Scientific Research Institute and corresponding member of the USSR Academy of Medical Sciences; N. V. Kosenko, deputy chief of the All-Union Soyuzlekarsprom Association of the Ministry of the Medical Industry; A. V. Polozhiy, professor at Tomsk University; A. I. Shreter, doctor of biological sciences, VILR [All-Union Scientific Research Institute of Medicinal Plants]; K. A. Sobolevskaya and V. G. Minayeva, professors at the Central Siberian Botanical Gardens of the USSR Academy of Medical Sciences Siberian Department; A. S. Saratikov, professor at Tomsk Medical Institute; V. P. Kaznacheyev, academician, USSR Academy of Medical Sciences; S. M. Nikolayev, scientific associate at the Biology Institute, Buryat Affiliate, USSR Academy of Sciences, Siberian Department, A. P. Prokopenko, professor at the All-Union Drug Chemistry and Technology Scientific Research Institute; M. A. Dzhumayev, rector of the Khabarovsk Pharmaceutical Institute; N. I. Grinkevich, professor at the First Moscow Medical Institute; D. A. Murav'yeva, professor at Pyatigorsk Pharmaceutical Institute; B. G. Pashinskiy, associate at the Tomsk Affiliate of the USSR Academy of Medical Sciences Oncology Center, and others.

12262
CSO: 1840/1605

CLINICAL PICTURE AND TREATMENT OF VENOMOUS EFFECTS OF CERTAIN SNAKES, ARACHNOIDS AND HYMENOPTERA

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 12, Dec 83 p 39

[Abstract of article by O. G. Babayev, Kh. B. Babayev]

[Text] A detailed profile of poisonous snakes, arachnoids and Hymenoptera is given, with a description of their biological characteristics. Experience in the treatment of 650 poisonous bite victims in Turkmenistan is analyzed, questions of the clinical picture and pathogenesis of venomous bites (differentiated by species) are explained. Therapeutic tactics, first aid for bite victims, and patient treatment in hospitals by means of hyperbaric oxygenation and various types of lasers, etc., is described.

12262
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UDC: 612.048

14TH CONGRESS OF ALL-UNION PHYSIOLOGICAL SOCIETY IMENI I. P. PAVLOV

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 6, Jun 84 (manuscript received 12 Jan 84) pp 846-860

SVETAYLO, E. N. and LANGE, K. A., Department of Physiology, USSR Academy of Sciences, Moscow; Scientific Council of USSR Academy of Sciences and Academy of Medical Sciences on Human Physiology, Leningrad

[Abstract] The 14th Congress of the All-Union Physiological Society imeni I. P. Pavlov was held in Baku 26 through 30 September, 1983. Fundamental and applied problems of the development of the physiological sciences were discussed at the congress, attended by 1700 scientists and specialists representing physiology, medicine and a number of related areas of science throughout the Soviet Union and in Bulgaria, Hungary, East Germany, Poland and Czechoslavakia. This article presents summaries of numerous papers read at the congress in such areas as neurophysiology and higher nervous activity, physiology of the sensory systems, physiology of the visceral systems, evolutionary and ecological physiology, physiology of productive animals, the history and theory of development of physiological sciences, and research methods in physiology. Scientific and organizational problems were also discussed.
[798-6508]

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